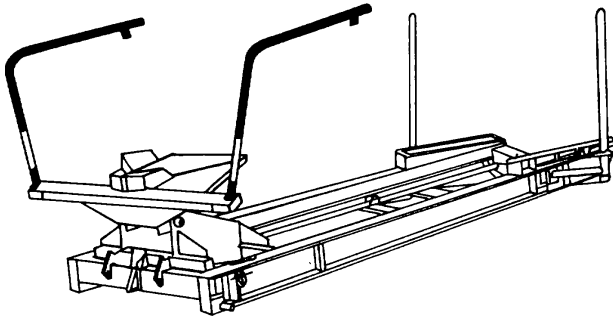


TECHNICAL MANUAL

**OPERATOR'S AND UNIT MAINTENANCE
MANUAL (INCLUDING REPAIR PARTS
AND SPECIAL TOOLS LIST)**



**CRADLE, BRIDGE ERECTION
BOAT, TWIN JET, ALUMINUM HULL
(2090-01-106-9789)**

**OPERATING
INSTRUCTIONS
PAGE 2-1**

**OPERATOR
MAINTENANCE
CHECKS
AND SERVICES
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**LUBRICATION
INSTRUCTIONS
PAGE 3-3**

**UNIT
PREVENTIVE
MAINTENANCE
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TROUBLESHOOTING
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**UNIT
MAINTENANCE
PROCEDURES
PAGE 3-8**

Approved for public release. Distribution is unlimited.

*This manual supersedes TM 5-2090-202-12&P, 29 September 1985, including all changes.

CHANGE

HEADQUARTERS DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. MARINE CORPS
WASHINGTON, D.C., 31 MAY 94

NO. 1

Operator's and Unit Maintenance Manual
(Including Repair Parts and Special Tools List)

CRADLE, BRIDGE ERECTION BOAT,
TWIN JET, ALUMINUM HULL
(NSN 2090-01-106-9789)

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TM 5-2090-202-12&P/TM 2090-12&P/1A, 21 May 1990, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

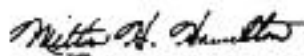
Insert pages

i and ii
C-25 through C-28

i and ii
C-25 through C-28

2. Retain this sheet in front of manual for reference purposes.

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TECHNICAL MANUAL
NO. 5-2090-202-12&P

HEADQUARTERS, DEPARTMENT OF
THE ARMY AND HEADQUARTERS U.S. MARINE CORPS
Washington, D.C., 21 May 1990

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished to you.

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WARNING

Cleaning solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well ventilated area. Avoid prolonged breathing of vapors. Keep solvent away from open flame. Do not use in excessive amounts.

WARNING

Do not allow cable to snag on rear of transporter. Serious injury may result if cable snags on transporter and then breaks or snaps loose.

WARNING

When applying a pretreatment primer, operator must wear eye protection.

WARNING

Cleaning solvents give off toxic fumes. Extreme caution should be used when cleaning with solvents to avoid breathing the fumes.

WARNING

Whenever boat is not on cradle, saddle freely pivots up or down on dolly and can cause injury if personnel do not exercise caution.

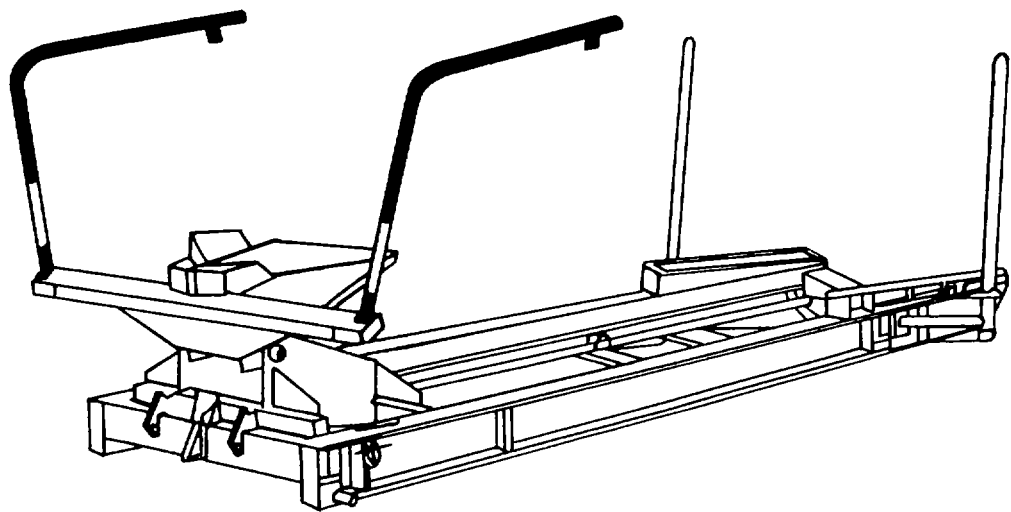
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CHAPTER 1
INTRODUCTION

INDEX

TITLE	SECTION	PAGE
General Information	I	1-1
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Section I. GENERAL INFORMATION



1-1. SCOPE

- a. Type of Manual..... Operators and Unit Maintenance Manual (Including Repair Parts and Special Tool List).
- b. Model Number and Equipment Name Cradle, Bridge Erection Boat, Twin Jet, Aluminum Hull NSN 2090-01-106-9789.
- c. Purpose of Equipment Used to transport, launch, and retrieve an aluminum hulled, twin jet bridge erection boat from the transporter.

1-2. MAINTENANCE FORMS, RECORDS AND REPORTS

a. Maintenance forms and procedures used by Army personnel will be those prescribed by DA Pamphlet 738-750, The Army Maintenance Management System (TAMMS).

b. Maintenance forms and records used by Marine Corps personnel are prescribed by TM 4700-15/1.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-3 for methods and procedures to destroy Army materiel to prevent enemy use.

1-4. REPORTING OF EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your Bridge Erection Cradle needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance.

a. Army--EIR will be prepared using SF 368, Quality Deficiency Report. Instructions for preparing EIRs are provided in DA Pamphlet 738-750, The Army Maintenance Management System. EIRs should be mailed directly to Commander, U.S. Army Troop Support Command, ATTN: AMSTR-QX, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

b. Marine Corps--EIRs should be submitted in accordance with MCO 1650.17 directly to: Commanding General, Marine Corps Logistics Base ATTN: Code 850, Albany, Georgia 31704-5000.

1-5. CORROSION PREVENTION AND CONTROL (CPC)

CPC of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report (QDR). Check the box to indicate that the problem may be corrosion-related. Using key words such as "rust," "deterioration," "pitting," or "cracking," or even including color photos of the corroded area, where possible, in your QDR will help in problem diagnosis and solution.

Submit form to Commander, U.S. Army Troop Support Command, ATTN: AMSTR-QX, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798.

1-6. LIST OF ABBREVIATIONS

Centimeter cm
Kilogram kg

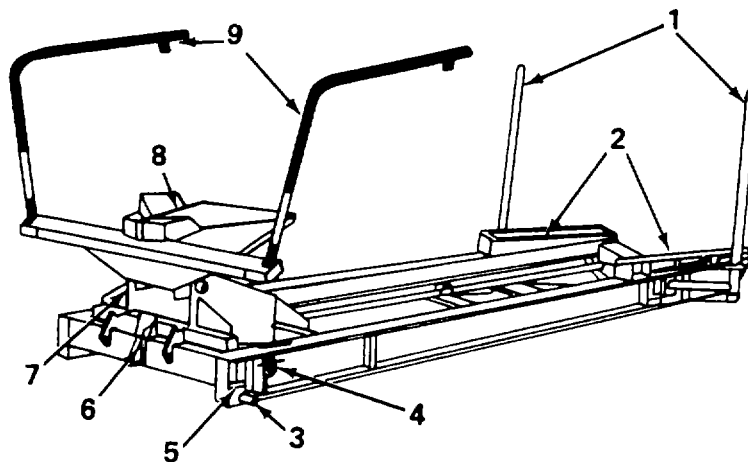
Section II. EQUIPMENT DESCRIPTION AND PRINCIPLES OF OPERATION

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

- Constructed of aluminum
- Can be stored on hardstand or on transporter.
- Can launch and retrieve a bridge erection boat, models USCSB MK-1 and MK-2 from transporter.

1-8. LOCATION AND DESCRIPTION OF COMPONENTS AND THEIR OPERATION

- (1) REAR STANCHIONS. Used to determine water depth during boat launch and retrieval. Also correctly positions boat on cradle during retrieval.
- (2) BOAT SUPPORTS. Supports the rear of the boat on the cradle.
- (3) STOP PINS. Front stop pins prevent the cradle from rolling off the transporter during launch and retrieval. Rear stop pins secure the rear of the cradle during transport.
- (4) SHACKLES. Used when hoisting cradle with sling.
- (5) FRAME. Main structural member of the cradle.
- (6) DOLLY RETAINER. Prevents dolly from rolling.
- (7) DOLLY. Rolls forward and back to launch and retrieve the boat.
- (8) CRADLE SADDLE. Supports the front of the boat during launching and retrieval.
- (9) FRONT STANCHIONS. Used to determine water depth during boat launch and retrieval. Also used to hold cables for convenience of boat crew during launch and retrieval.



1-8. LOCATION OF COMPONENTS-Continued

(10) CABLE ASSEMBLIES. Used to secure the boat to the cradle.

NOTE

The following items are not cradle components. They are components of the ribbon bridge transporter used in cradle operation.

(11) ROLLER ASSEMBLIES. Used to adapt the ribbon bridge transporter for boat and cradle operation.

(12) TRANSPORTER. Used to transport cradle.

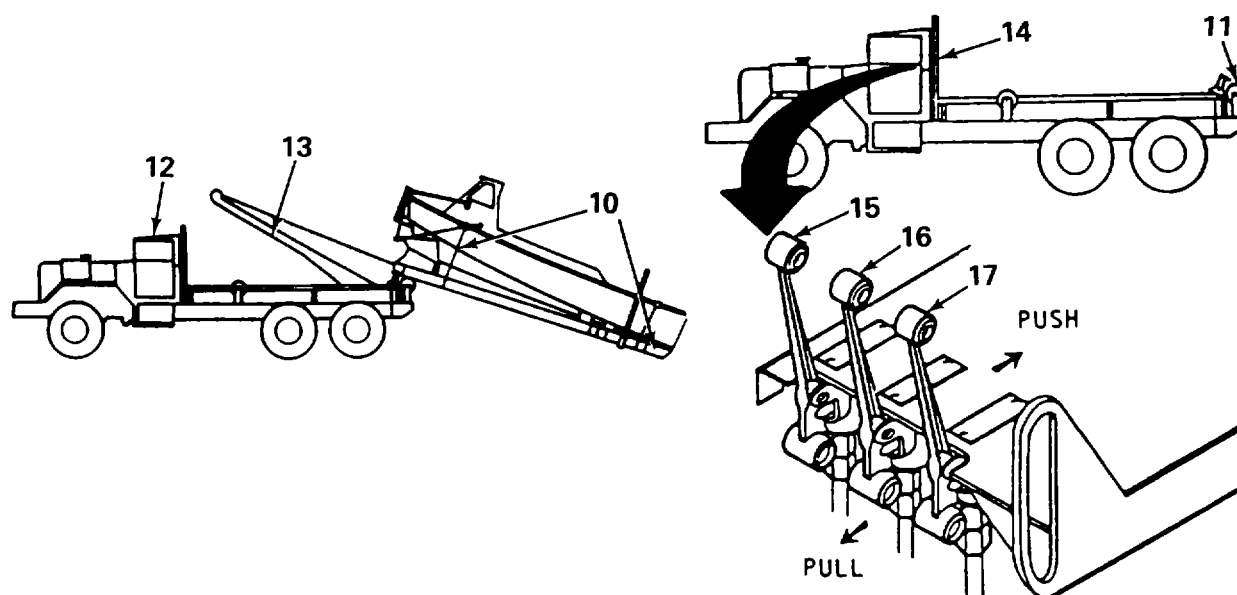
(13) TRANSPORTER BOOM. Used to elevate cradle during loading and unloading operation.

(14) TRANSPORTER BOOM CONTROLS. Used to position boom.

(15) HYDRAULIC PIN LEVER. Used to disengage and engage transporter forward locking pin, which secures cradle to transporter.

(16) WINCH CONTROL LEVER. Used to pay out and retract cable.

(17) BOOM CONTROL LEVER. Used to raise and lower boom.



1-9. EQUIPMENT DATA

Dimensions

Length	283.38 inches (7.198 meters)
Width.....	116.25 inches (2.952 meters)
Height.....	96.25 inches (2.444 meters)

Weight

Boat.....	9000 pounds (4082.4 kg)
Cradle.....	1800 pounds (816.48 kg)
Boat and Cradle (Total)	10800 pounds (4898.88 kg)

CHAPTER 2 OPERATING INSTRUCTIONS

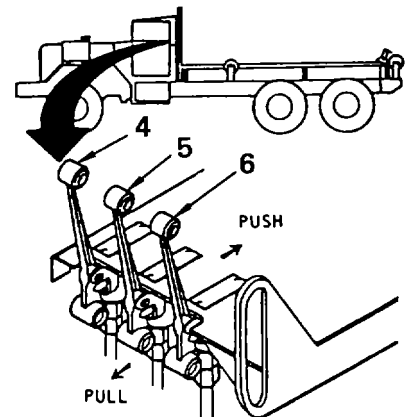
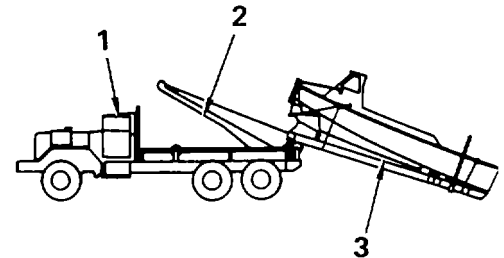
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Operation Under Usual Conditions	III	2-3
Operation Under Unusual Conditions	IV	2-20

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. TRANSPORTER BOOM CONTROLS

- a. TRANSPORTER (1) is used to transport the cradle to and from launch or retrieval site.
- b. BOOM (2) is used to elevate the cradle during launch or retrieving operation.
- c. CRADLE (3) is used to transport, launch and retrieve Bridge Erection Boat.
- d. HYDRAULIC PIN LEVER (4) is used to engage and disengage the forward locking pin which secures the cradle to the transporter. Push lever to disengage forward locking pin. Pull lever to engage forward locking pin.
- e. WINCH CONTROL LEVER (5) is used to extend and retract cable during launch or retrieve operation. Push lever to extend cable. Pull lever to retract cable.
- f. BOOM CONTROL LEVER (6) is used to control the up and down movement of the boom on the transporter. Push lever to raise the boom. Pull lever to lower the boom.



Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. GENERAL

- a. Before You Operate. Always keep in mind the CAUTIONS and WARNINGS. Perform the before (B) PMCS.
- b. While You Operate. Always keep in mind the CAUTIONS and WARNINGS. Perform the during (D) PMCS.
- c. After You Operate. Be sure to perform the after (A) PMCS.
- d. If the Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the forms prescribed in DA Pamphlet 738-750 (Army) and TM 4700-15/1 (MC).

2-3. OPERATOR'S PMCS TABLE

NOTE

A complete check of the cradle will be made after the boat has been removed from cradle.

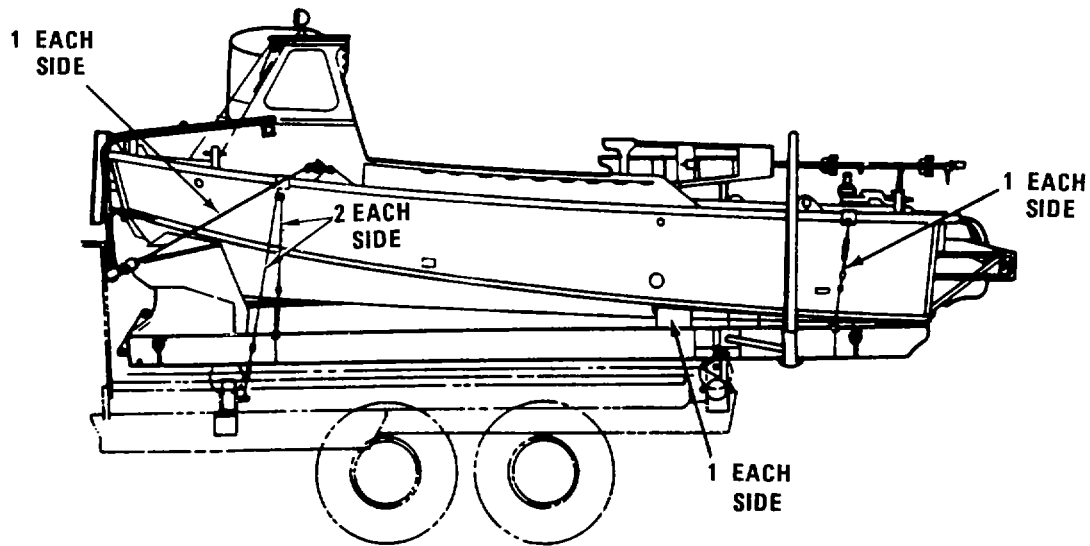
B-Before
D-During

A-After Operation
W-Weekly

M-Monthly

Item No.	Interval					Item to be inspected	Procedures check for and have repaired as necessary	Equipment is not ready/ available if:
	B	D	A	W	M			
1	°	°	°			Cradle and Dolly	Inspect for damaged or missing components.	Cradle or Dolly are damaged or have missing parts. Cables and ropes are kinked, frayed, or worn or turnbuckles have damaged or missing hardware. Rubber pads are torn more than three inches in any area or are not secured to supports.
2	°	°	°			Cable Assemblies	Inspect for worn, damaged, frayed or broken cable assemblies	
3	°	°	°			Rubber Pads	Inspect for worn, loose, or damaged pads.	

2-3. OPERATOR'S PMCS TABLE-Continued



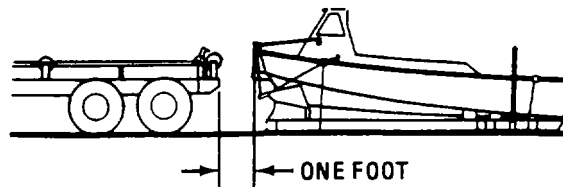
Section III. OPERATION UNDER USUAL CONDITIONS

2-4. LOADING

CAUTION

Ensure the bogie brackets are in place and properly adjusted. Refer to TM 5-5420-209-12.
Using bogie brackets when loading cradle helps prolong the life of the transporter frame.

- a. Use an assistant to guide the driver of the transporter so that the rear support of the transporter is about one foot in front of the forward (dolly) end of the cradle.

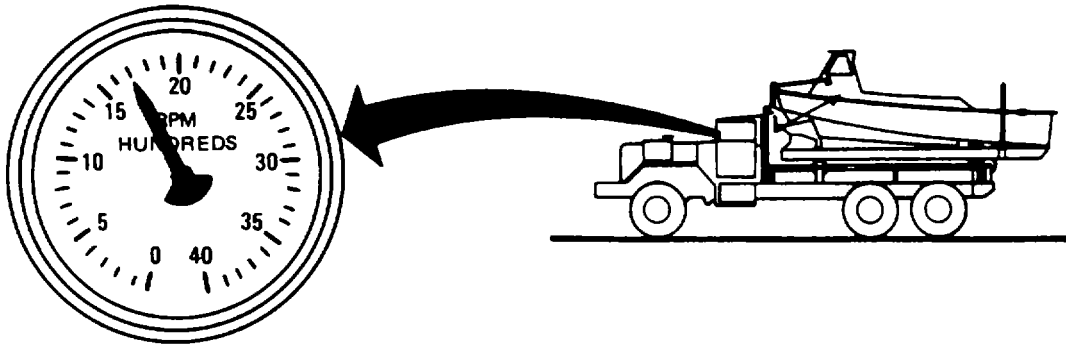


2-4. LOADING-Continued

NOTE

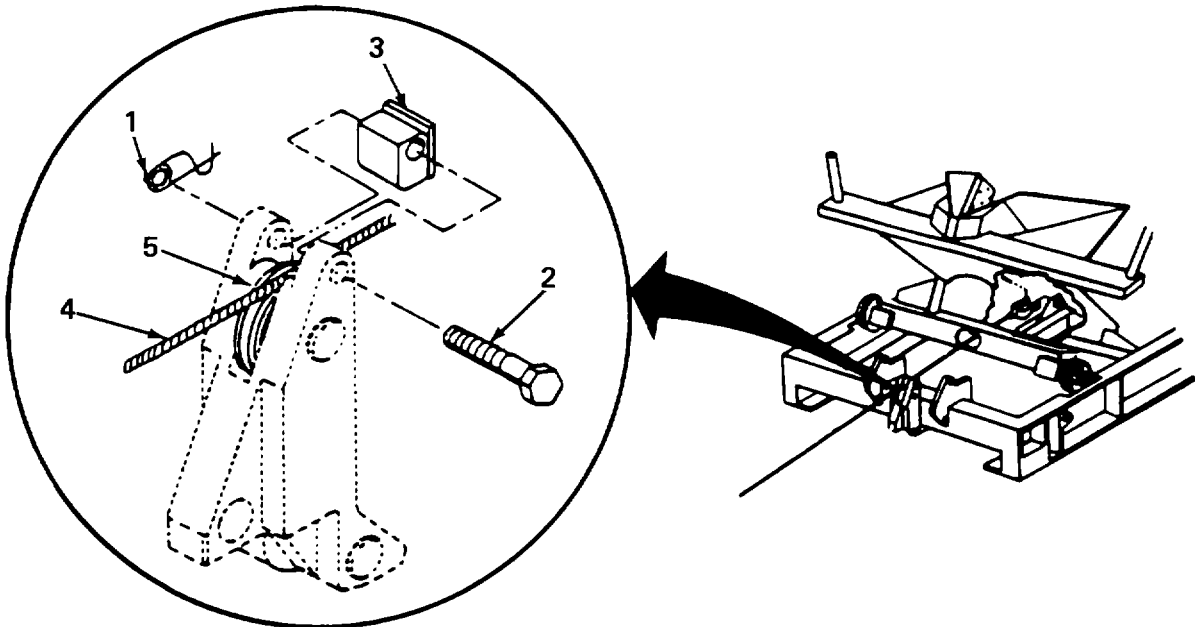
Make sure that the cradle side beams are in line with the inboard rollers in the transporter rear support.

- b. Engage the power takeoff for the hydraulic pump. Refer to TM 5-5420-209-12.
- c. Set the hand throttle so that the transporter engine operates at 1700 RPM.



- d. Take your position as driver/operator at the boom controls.
- e. Push the hydraulic pin lever to disengage the forward locking pin. Push the winch control to pay out enough slack in the cable to allow the hook to reach the ground. When using the M812 transporter, keep tension on the cable as it unwinds.
- f. Push the boom elevation control to raise the boom slightly beyond the vertical. Continually pay out the cable while raising the boom. Continue to pay out until there are approximately three feet of cable on the ground.

2-4. LOADING-Continued



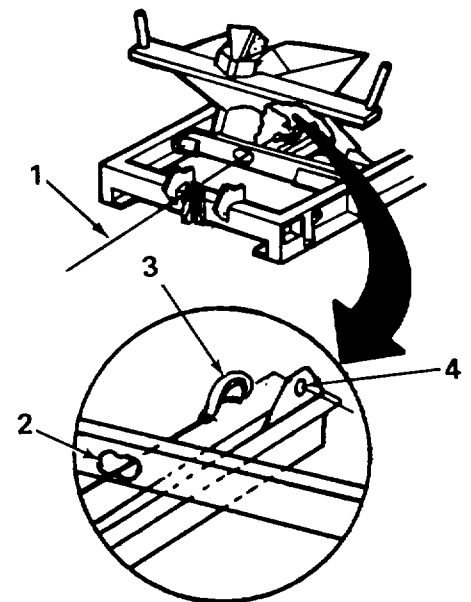
g. Remove the retainer (1), from bolt (2), and remove the bolt (2) and the cable retainer block (3).

h. Place the boom cable (4) on the sheave (5).

i. Thread the winch cable (1) through the hole in the base of the dolly (2) and connect winch cable hook (3) to the base of the dolly (4).

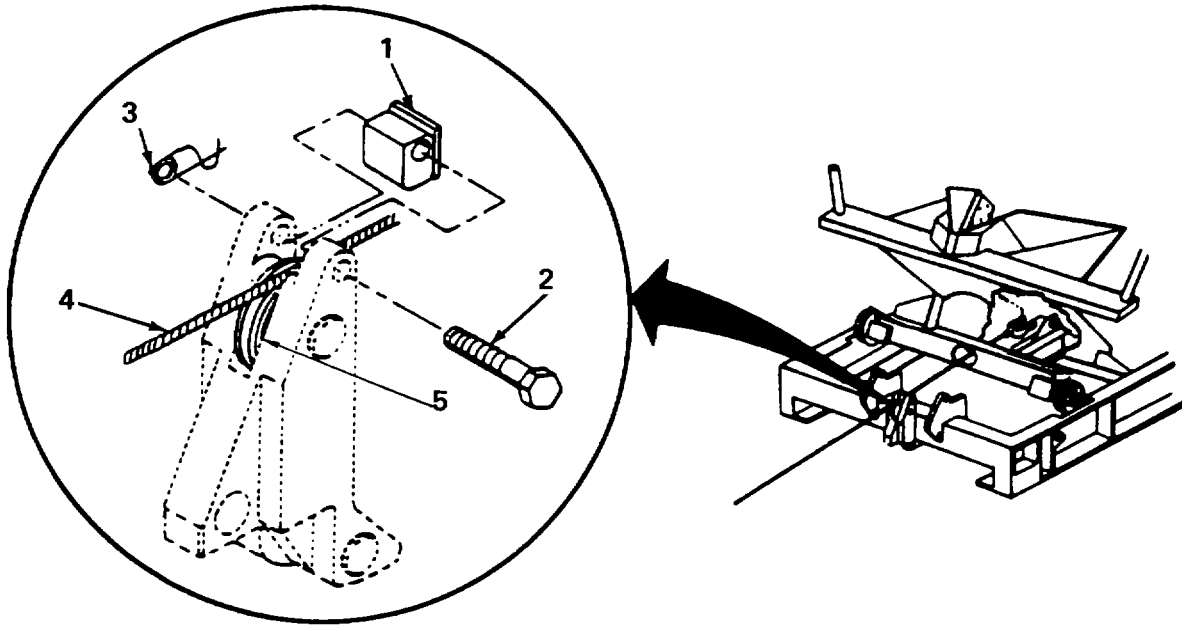
WARNING

Install cable retainer block so that the rounded corner is facing forward and down against the cable. Improper installation of the block will cause cable failure. Serious injury may result if cable fails.



2-4. LOADING-Continued

j. Reinstall the cable retainer block (1), retaining bolt, (2), and retainer (3) so that the boom cable (4) runs between the cable retainer block (1) and the sheave (5). Ensure that dolly retainer latch is securing dolly to front of cradle base.



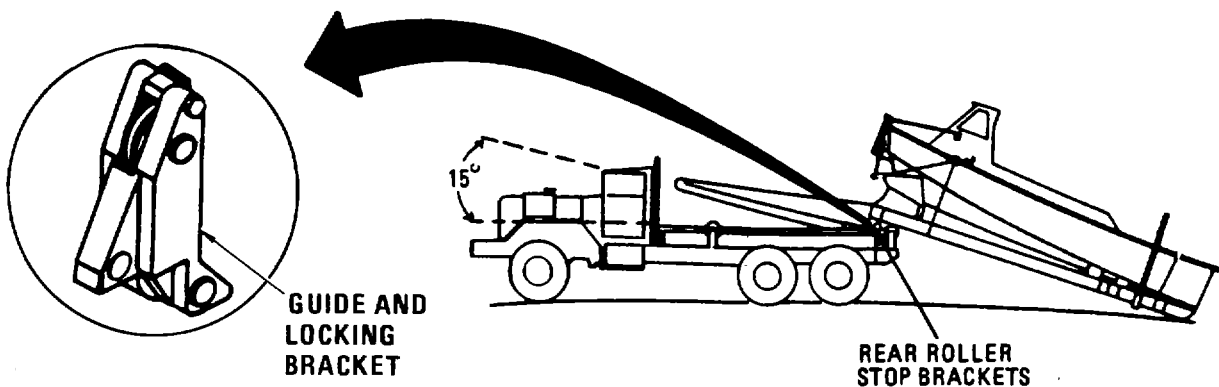
WARNING

Do not allow cable to snag on rear of transporter. Serious injury may result if cable snags on transporter and then breaks or snaps loose.

k. Pull the winch control lever to rewind the boom cable. Lift the dolly end of the boat cradle until the forward end stop pins clear the stop brackets on the transporter rollers.

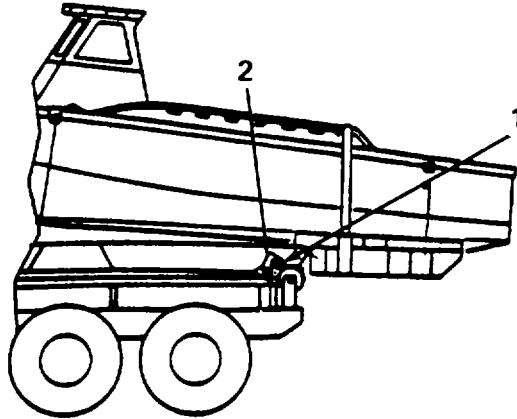
l. Release the transporter parking brake and the brake lock.

m. Pull the boom control lever to lower the boom. Operate winch as needed to position the guide and locking bracket into the boom center slot. Pay out the cable until the cradle front stop pins rest on the rear roller stop brackets. Lower the boom to about 3 feet.



2-4. LOADING-Continued

n. Rewind the winch to pull the cradle onto the transporter. Continue to rewind the winch cable and lower the boom until the cradle is stopped by the seating of the rear cradle stop pins (1) against the stop brackets (2).



CAUTION

Idle engine at 500 RPM maximum to prevent damage to hydraulic pin.

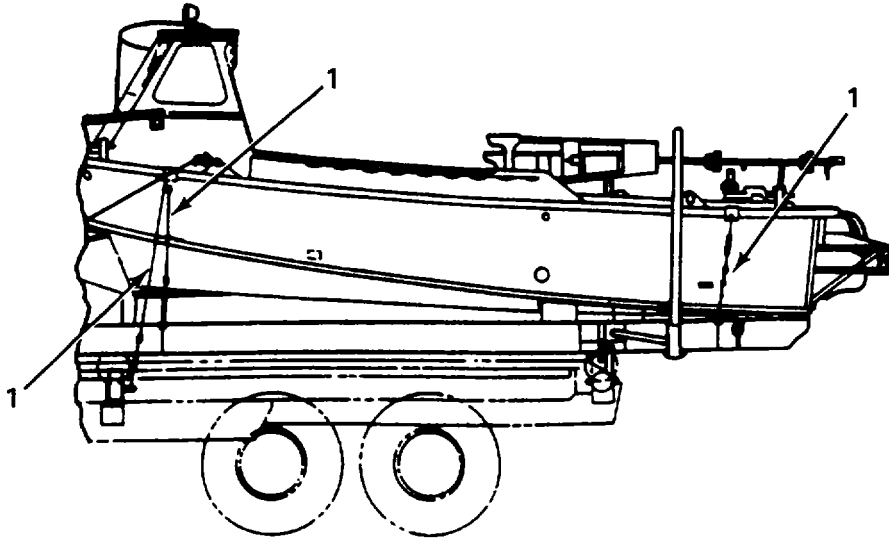
o. Pull the hydraulic pin lever to engage the forward locking pin.

2-4. LOADING-Continued

p. Secure the cable assemblies (1) on each side of the cradle to the transporter. Install safety pin near boom locking pin into place.

CAUTION

Ensure boat cab is removed and light mast is lowered and secured in accordance with TM 5-1940-277-10 prior to moving transporter from the area.

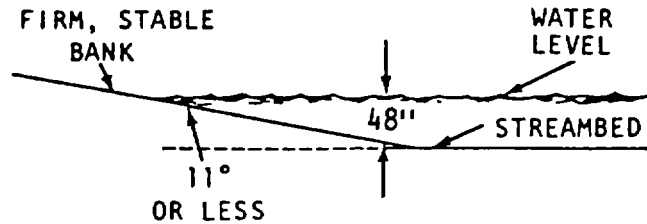


q. Return the hand throttle to idle position; disengage the power take-off; select the proper range for the transfer case; and drive the transporter to the desired location. Refer to TM 5-5420-209-12.

2-5. LAUNCHING, CALM WATER

CAUTION

Do not launch boat when the streambed slope is more than 11° and water depth is less than 48 inches. Damage to the boat will occur.



a. Select or prepare a launch site having stable soil, a uniform bank and a streambed slope of 11° or less. The site will also have a water depth of 48 inches or more beyond the launch point, and a stream velocity of not more than 5 feet per second. Drive the transporter to the launch site, back it into position near the water.

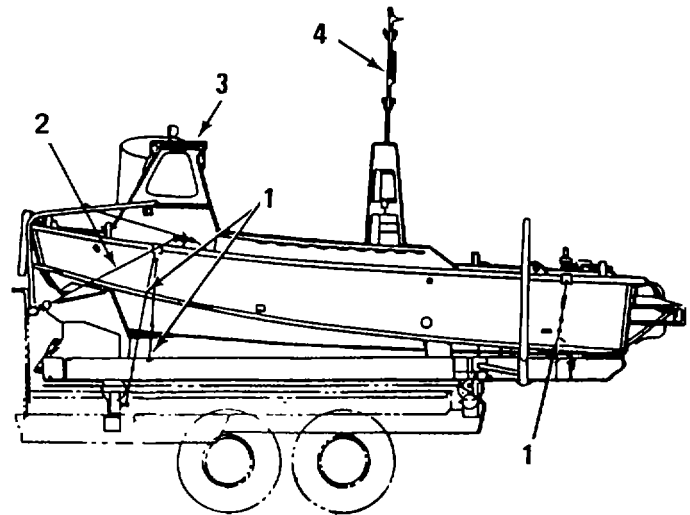
b. Install front stanchions (para. 3-1). Remove six tie-down cable assemblies (1). Remove safety pin near boom locking pin.

NOTE

Leave the two cables (2) attached that secure the boat to the dolly.

c. Have boat operator and crew install cab (3) and raise mast (4) in accordance with TM5-1940-277-10. Have boat operator place scoop control levers in full forward position.

d. Have the boat operator assume his position in the boat.



2-5. LAUNCHING, CALM WATER-Continued

CAUTION

Do not submerge the boom winch when positioning transporter. Damage to winch will occur.

e. Back the transporter into the water until the boom clears the water by approximately 12 inches (31 cm).

NOTE

Boom must clear water by roughly 12 inches (31 cm).

f. Disengage dolly retainer.

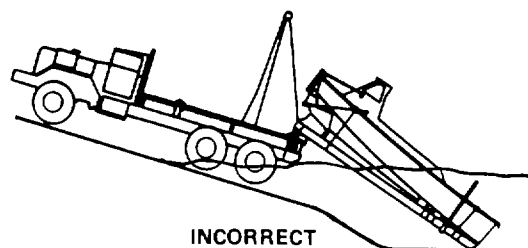
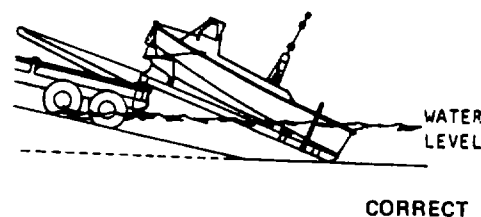
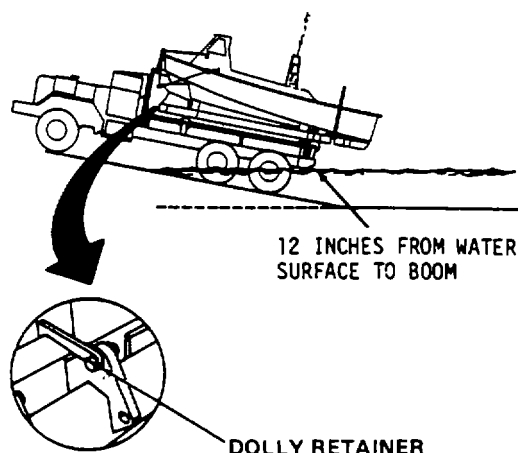
WARNING

Failure to engage both the parking brake and the brake lock could result in injury or death.

g. Apply transporter service brake; place the transmission in neutral, engage the parking brake and the brake lock. Engage transporter power take-off. Set the hand throttle to operate the engine at 1700 RPM. Refer to TM 5-5420-209-12.

h. At the transporter boom controls, push the lever to disengage the forward locking pin. Use the boom control to raise the boom about 3 feet.

i. Push the winch control (middle) lever to pay out the boom cable and allow the cradle to slide into the water. The stern of the boat will enter the water when the end of the boat cradle is submerged. The cradle will begin to tilt when the center of gravity passes the rollers on the rear support. Continue to pay out the boom cable and adjust the boom elevation until the end of the cradle rests on the stream bottom. When the cradle bottoms, the rear stanchions must show six inches length remaining above water but not more than two feet. If not, the truck with boat must be relocated and the launch procedure attempted again.



2-5. LAUNCHING, CALM WATER-Continued

CAUTION

The boat must not be launched when the rear stanchions show less than six inches or more than two feet above water length with cradle end on the bottom.

If the rear stanchions show less than six inches length above water line when the boat cradle end is bottomed, the engine is subject to damage if launched.

j. Pay out more cable, so that the dolly travels down into the water until the water is in the center of the yellow band on the front stanchions.

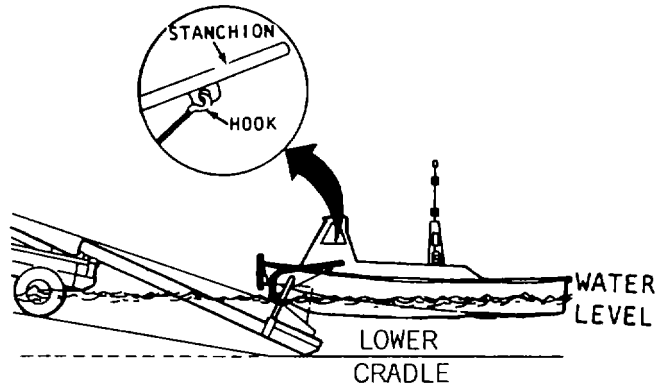
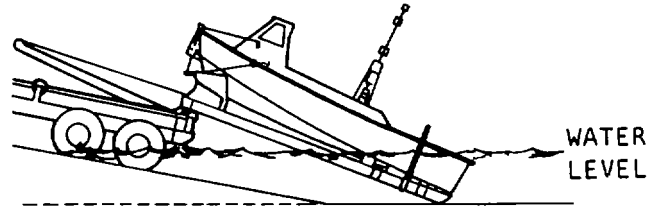
NOTE

For calm water launching, the yellow markings on the forward stanchions should be in water. It may be necessary to retrieve cradle and back transporter further into the water until this condition is satisfied.

k. Signal the boat operator to start the boat engines and release tension on cables by moving the boat forward. The boat crew will disconnect the cable from boat and attach the cables to the front stanchion. The boat operator will back the boat clear of the cradle.

l. After the boat has cleared the cradle rear stanchions, operate the winch control to rewind the boom cable and retract the dolly until it is fully forward. Continue to rewind the cable and the boom until the cradle is fully on the transporter. Cradle is in correct position when the holes for the transporter locking pin align.

m. Disengage the transporter power take-off and return the transporter to shore. Refer to TM 5-5420-209-12.



2-6. RETRIEVAL

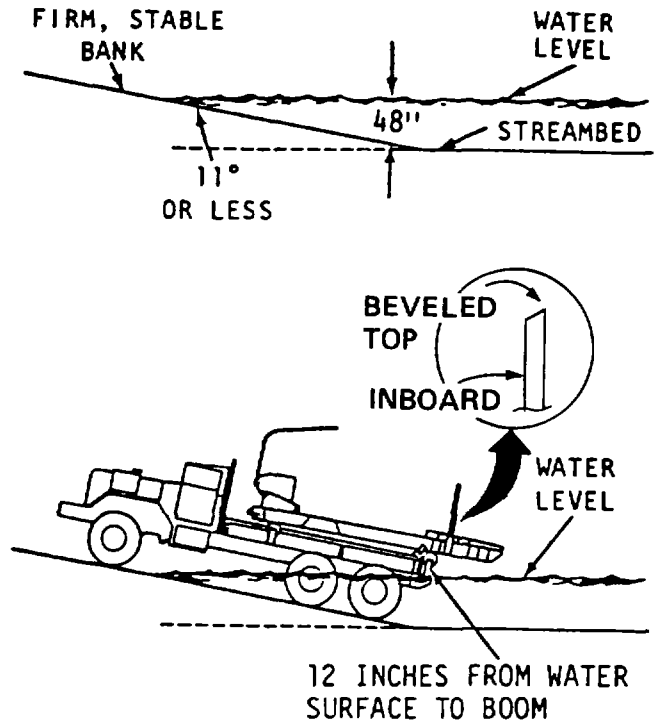
a. Select or prepare a site having stable soil, a uniform bank, and a streambed slope of 11° or less. The site will also have a water depth of 48 inches or more beyond the launch point, and a stream velocity of not more than 5 feet per second.

CAUTION

To avoid damage to boat, ensure that stanchions are properly installed with the bevel top facing the cradle. Rubber rail can be damaged if stanchions are installed backward.

b. Ensure rear stanchions are in place on cradle with bevel top facing inboard.

c. Drive the transporter to the retrieval site and back it into position near the water. Continue to back the transporter into the water until the boom clears the water by approximately 12 inches (31 cm). Do not submerge the boom winch.



WARNING

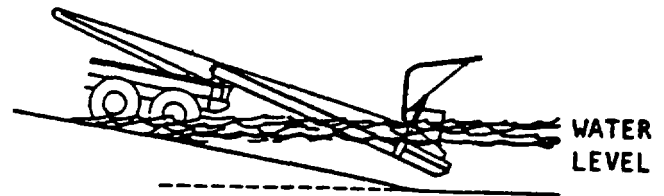
Failure to engage both the parking brake and the brake lock could result in injury or death.

d. Apply transporter service brake, place the transmission in neutral, and engage the parking brake and the brake lock. Engage the power take-off. Set the hand throttle to operate the engine at 1700 RPM.

e. At the transporter boom controls, push the lever to disengage the forward locking pin. Use the boom controls to raise the boom about 3 feet.

NOTE

It may be necessary to move the transporter forward if the cradle is not extended enough to seat the stop pins against the stop brackets.



f. Push the winch control lever to pay out the boom cable and allow the cradle to slide into the water. The cradle will begin to tilt when the center of gravity passes the rollers on the rear support. Continue to pay out the boom cable until the front cradle stop pins engage the stop brackets on the rear rollers.

2-6. RETRIEVAL-Continued

NOTE

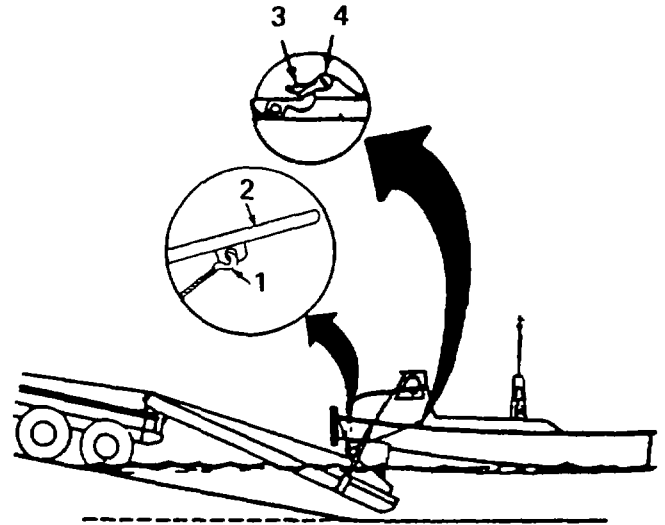
The yellow marks on the forward stanchions should be in water. If not, retrieve the cradle and back the transporter further in the water and repeat operation until stanchions are in proper depth before attempting to retrieve boat. It may be necessary to move transporter forward if the cradle is not extended enough to seat stop pins against stop brackets.

CAUTION

Do not strike the saddle with such force that it would cause the bow of the boat to override the saddle. This will cause damage to the saddle.

g. Signal the boat operator to approach the cradle from downstream side and move the boat onto the saddle. When the bow of the boat seats into the saddle, the saddle will pivot forward and up. The boat operator will then keep only enough throttle to keep saddle up, but not move dolly up cradle frame.

h. The boat crew will unhook the restraining cables (1) from the stanchions (2) and connect the restraining cable hooks (3) to shackles (4).



i. The boat operator will release the pressure against the saddle so that the tension is applied against the restraining cables (1) prior to stoppage of the boat.

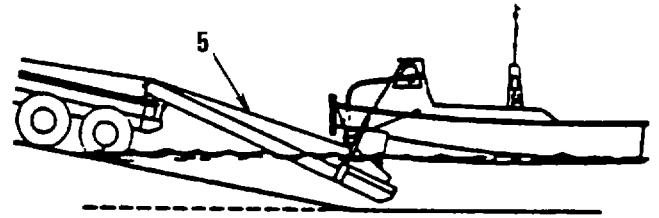
CAUTION

Make sure that the hull is seated on the rubber pads on the saddle.

j. Pull the winch control lever to rewind the boom cable and retract dolly. As the bow emerges from the water, make sure that the hull is seated on the rubber pads of the saddle.

2-6. RETRIEVAL-Continued

k. Continue to rewind the boom cable (5) with winch control lever and lower the boom with the boom control lever so that the boat and cradle are fully retrieved.



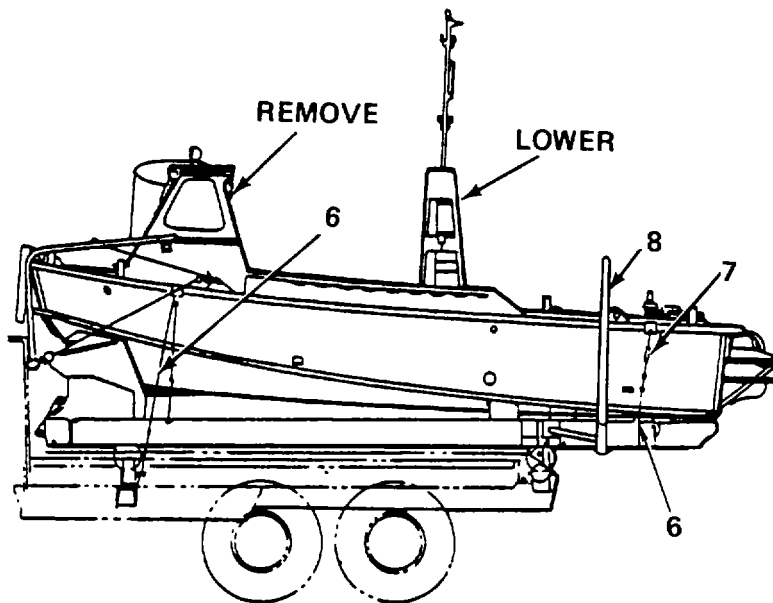
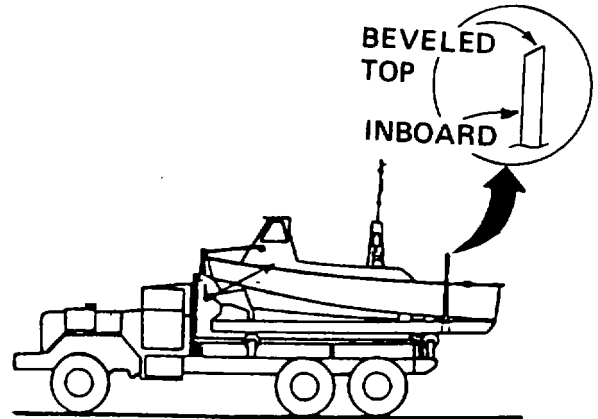
l. Pull hydraulic pin lever to engage the forward locking pin. Engage dolly retainer.

m. Return hand throttle to idle; depress the clutch pedal; and lift the control lever to disengage the power take-off. Refer to TM 5-5420-209-12.

n. Move the transporter to a suitable site.

o. Attach six tie down (3 on each side) cables (6) to secure the boat to the cradle and transporter. Tighten the cables (6) with turnbuckles (7). Install safety pin near boom locking pin. Remove front stanchions.

p. Have boat operator and crew remove the cab and lower light mast in accordance with TM5-1940-277-10.



2-7. UNLOADING

a. Apply the transporter brake system; place the transmission in neutral. Engage the power take-off; set the hand throttle to operate the engine not to exceed 1700 RPM maximum. Refer to TM 55420-209-12.

CAUTION

Ensure bogie brackets are in place on transporter before unloading cradle. Refer to TM 5-5420-209-12.

b. Release the cables (1) (one on each side) from transporter (2).

c. Push the hydraulic pin lever at the transporter to disengage forward locking pin.

d. Engage dolly retainer (3) to ensure that the dolly will not move when winch cable is slacked.

e. Push the boom control lever to elevate the boom about three feet. Slowly pay out cable by pushing winch control lever so that the cradle rolls downward over the rear rollers.

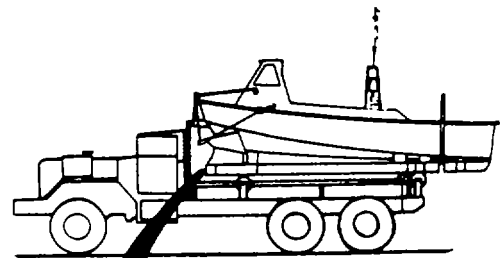
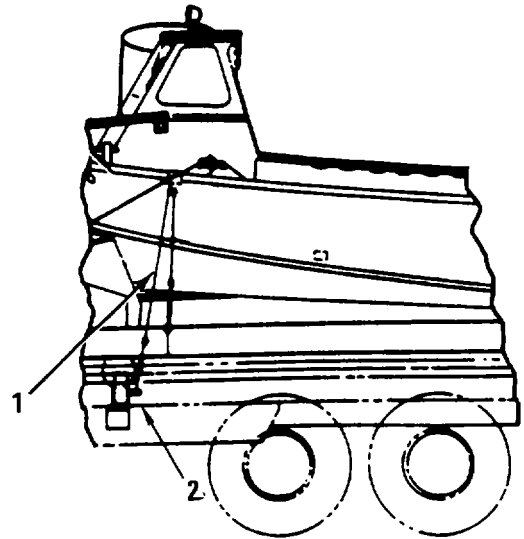
NOTE

Cradle may be unloaded without the bridge erection boat.

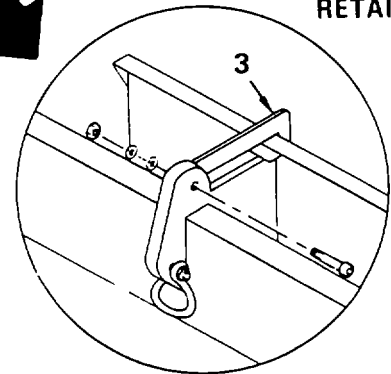
f. After the cradle center of gravity passes the rollers, allow the cradle to come to rest on the ground.

g. Release the service brakes, and pay out cable.

h. The transporter will move forward until the cradle forward stop pins engage the rear stop brackets.



**DOLLY
RETAINER**



2-7. UNLOADING-Continued

i. Elevate the boom to a vertical position and adjust cable as needed. Rewind cable slightly to raise the cable so that the stop pins will clear the stop bracket.

j. Move the transporter forward about two feet. Stop the transporter. Place the transmission in neutral and engage the brake lock.

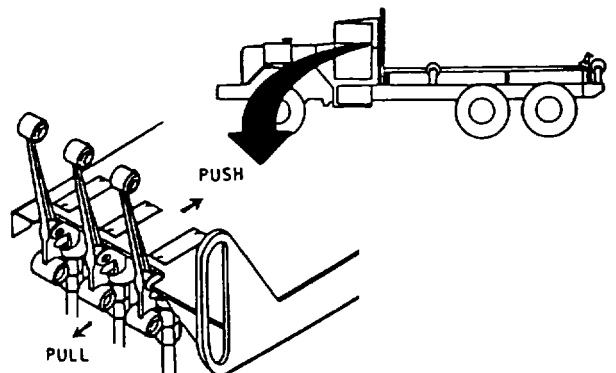
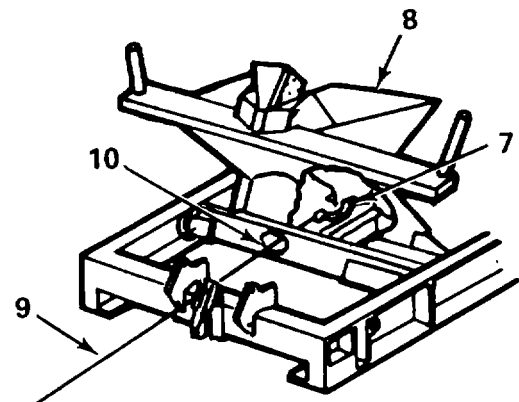
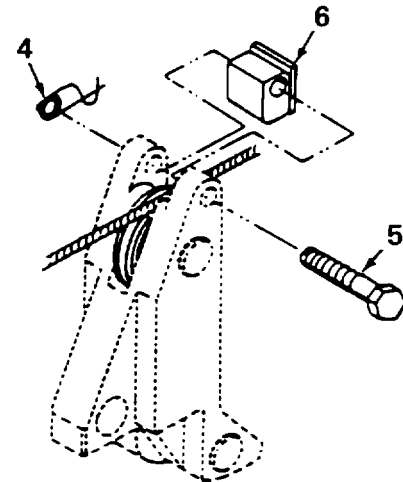
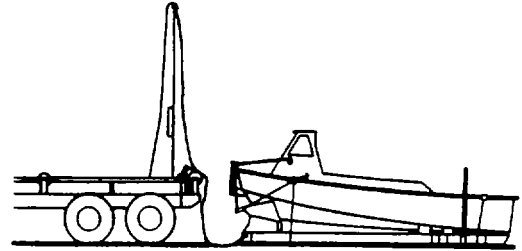
k. Elevate the boom to maximum and slowly lower the front end of the cradle to the ground. Pay out an additional three feet of slack cable.

l. Remove retainer (4) from bolt (5), and remove bolt (5), and cable retainer block (6).

m. Disengage the hook (7) from the dolly (8) and pull cable (9) and hook (7) through the hole in the dolly beam (10) and lift the cable (9) off the sheave.

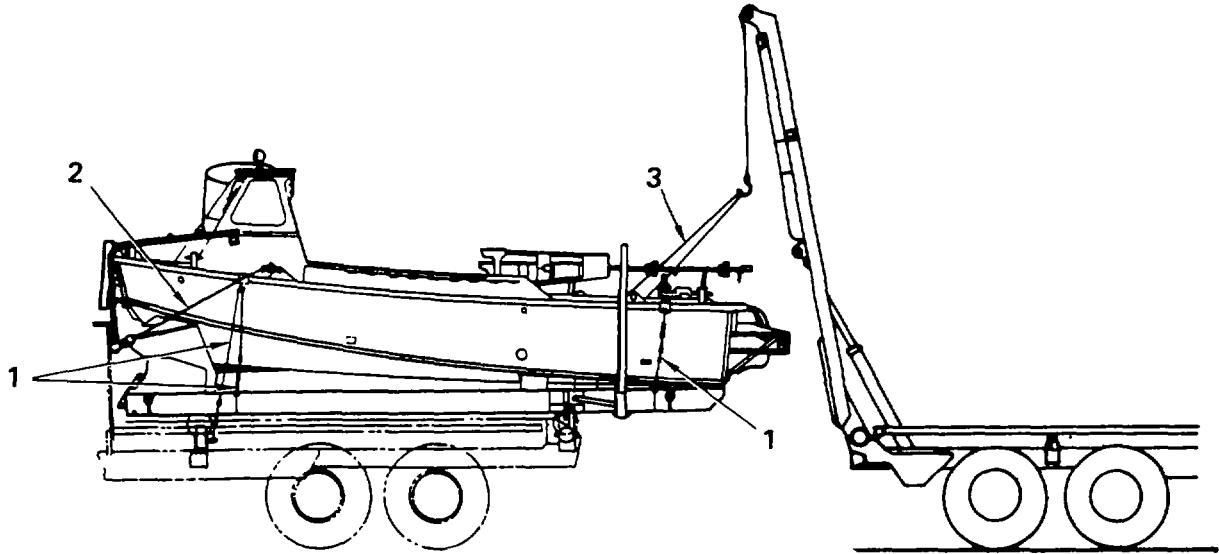
n. Reinstall the cable retainer block (6), the bolt (5), and retainer (4).

o. Pull winch control lever to rewind cable (9) and pull boom control lever to lower boom.



2-8. UNLOADING BOAT FROM CRADLE

- a. Unload the cradle and boat from the transporter, para 2-7. Leave the transporter backed to cradle.
- b. Remove the six cable assemblies (1). Leave the restraining cables (2) connected to the boat.



NOTE

Either a lifting device capable of lifting 5 tons or another transporter may be used to lift boat from transporter.

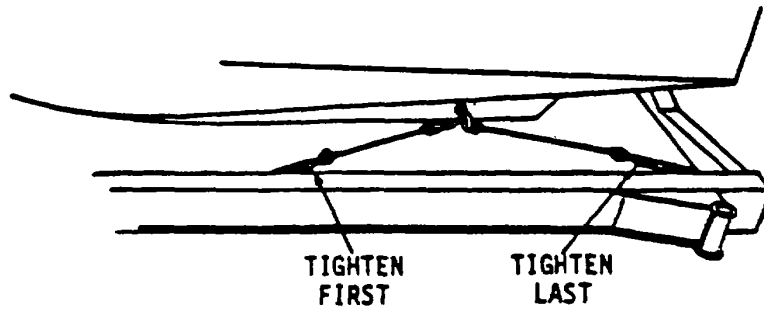
- c. Either back a second transporter to rear of boat as shown, or position lifting device over rear of boat. Hook a heavy lifting chain or cable (3) across the rear lifting eye of the boat and secure. Connect the lifting device or transporter boom hook to the center of the chain or cable.
- d. Raise the rear of the boat until it clears the cradle by at least 4 inches.
- e. Lower the beaching legs on the rear of the boat by pulling the quick release pins and letting them slide down. Replace the pins.
- f. Return to the front of the cradle. Remove the boom cable from the dolly assembly. Thread the cable through one of the shackles on the rear of the transporter and connect it to the shackle on the front of the cradle on the same side. Release the dolly retainer latch. Slowly pull the transporter forward until the dolly stops on the cradle rear stop pins.
- g. Place cribbage under the beaching legs of the boat and slowly lower the rear of the boat until it rests securely on the cribbage under the beaching legs.
- h. Detach the lifting device and remove the chain or cable from the rear of the boat.

2-8. UNLOADING BOAT FROM CRADLE-Continued

- i. Move the lifting device at the rear of the boat to the front of the boat. If using a second transporter to lift boat, remove rear stanchion on side of cradle where second transporter is positioned. Connect lifting device or transporter to the front lifting eye of the boat. With boom fully extended, or using lifting device, raise the front of the boat to release the tension on the restraining cables. Disconnect the restraining cables. Lift the front of the boat until it clears the cradle by at least 4 inches.
- j. Pull the cradle clear of the boat by slowly pulling transporter forward.
- k. Place cribbage under the front keel of the boat and lower the boat onto the cribbage.
- l. Unhook the lifting device from the boat and move away.

2-9. TRANSPORT BY RAIL, SHIP, AIR AND TRUCK

- a. Insert shackle of shipping tiedown cables in hole on boat keel.
- b. Tighten forward cable turnbuckles to bring boat forward.
- c. Tighten rear turnbuckles last.



CAUTION

Shipping tiedown cables should be secured when boat and cradle are being transported long distances on the Ribbon Bridge Transporter or by rail, ship or air.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-10. LAUNCHING, FAST WATER

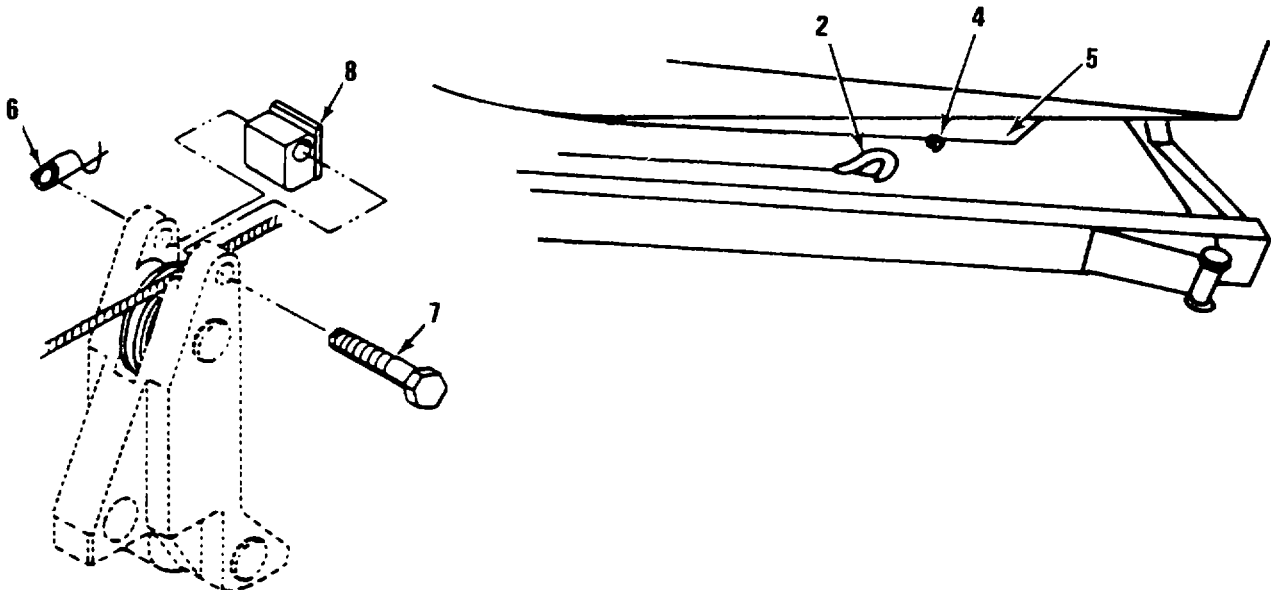
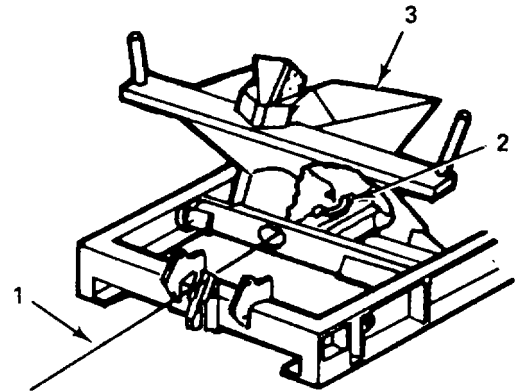
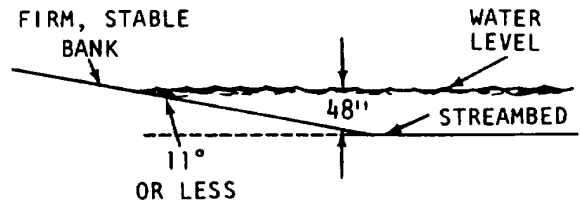
CAUTION

Do not launch boat when the streamed slope is more than 11° and water depth is less than 48 inches. Damage to the boat may occur.

a. Select or prepare a launch site having stable soil, a uniform bank and a streamed slope of 11° or less. The site will also have a water depth of 48 inches or more beyond the launch point and a stream velocity of more than 5 feet per second.

b. Make sure transporter tie down pin is in the locked position in accordance with TM 5-5420-209-12.

c. Slack the winch cable (1); remove hook (2) from dolly (3); install a shackle (4) to boat keel (5); and reconnect hook (2) to shackle (4). Remove retainer pin (6), bolt (7), and retainer block (8).



2-10. LAUNCHING, FAST WATER - Continued

d. Remove the six tie down cable assemblies (9) and the two rear stanchions (both sides) (10). Leave two front restraining cables (11) in place. Install front stanchions. Remove safety pin from near boom locking pin.

e. Have boat operator and crew install cable and raise light mast in accordance with TM 5-1940-277-10. If boat being launched is MK-2 model, have boat operator start engines in accordance with TM 5-1940-277-10 and set throttle to 2000 RPM just prior to launch.

NOTE

Check that dolly retainer is unhooked before winch cable is taken off.

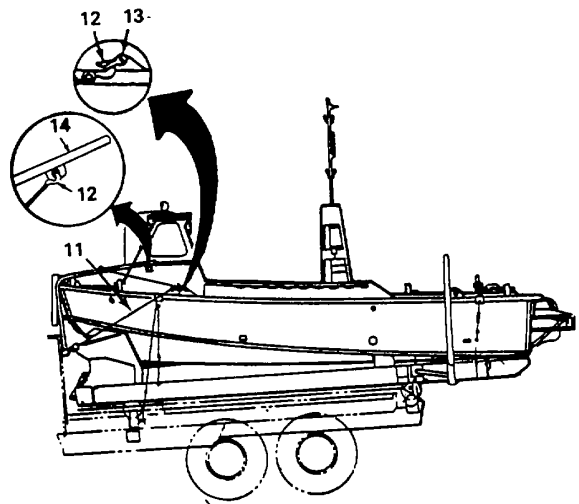
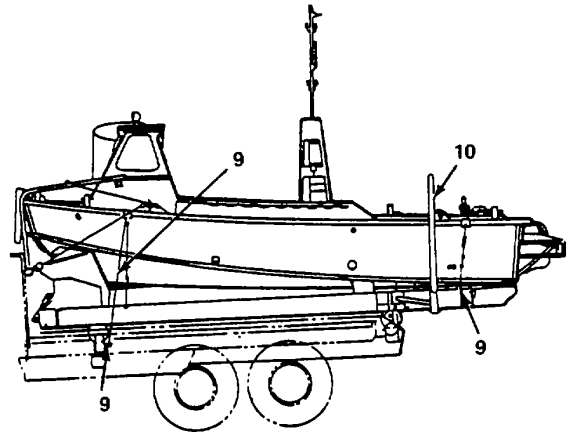
f. Fasten a safety line to the cradle front cross-member and attach to transporter near lifting shackle.

WARNING

Route safety line so that it is free of obstacles. Serious injury may result if line snags on transporter or loose items.

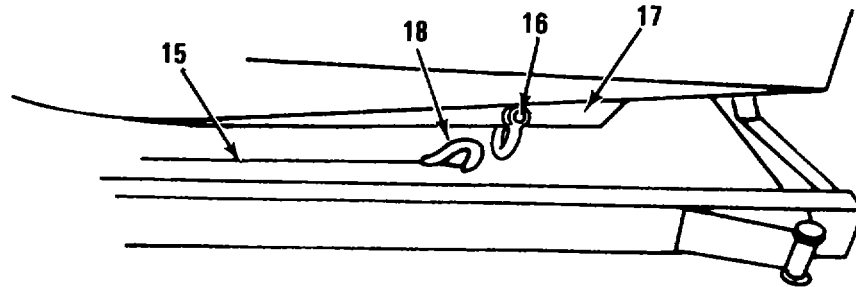
g. Back the transporter down to the water and engage the brake lock.

h. Winch the boat forward by pulling the winch control lever until the two restraining cables (11) are slightly loose. Remove the hook (12) from lifting shackle (13) and install hook (12) into eyes on the front stanchions (14).



2-10. LAUNCHING, FAST WATER - Continued

i. Push the winch control lever to release the pressure on the winch cable (16), remove the shackle from the boat keel (17) and hook (18). Pull the winch cable (15) free of cradle and place on top of the transporter cab, insuring that the winch cable is free of cradle and boat.



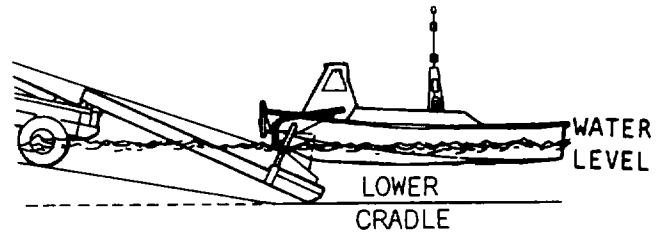
j. Release the parking brake and brake lock and allow the transporter to roll back into the water. Stop when the bottom of the boom touches the water. Reset parking brake and brake lock. (For M812 transporter chassis, refer to TM 9-2320-260-10, for M945 chassis, refer to TM 9-2320-272-10).

WARNING

Failure to engage both the parking brake and the brake lock could result in injury or death.

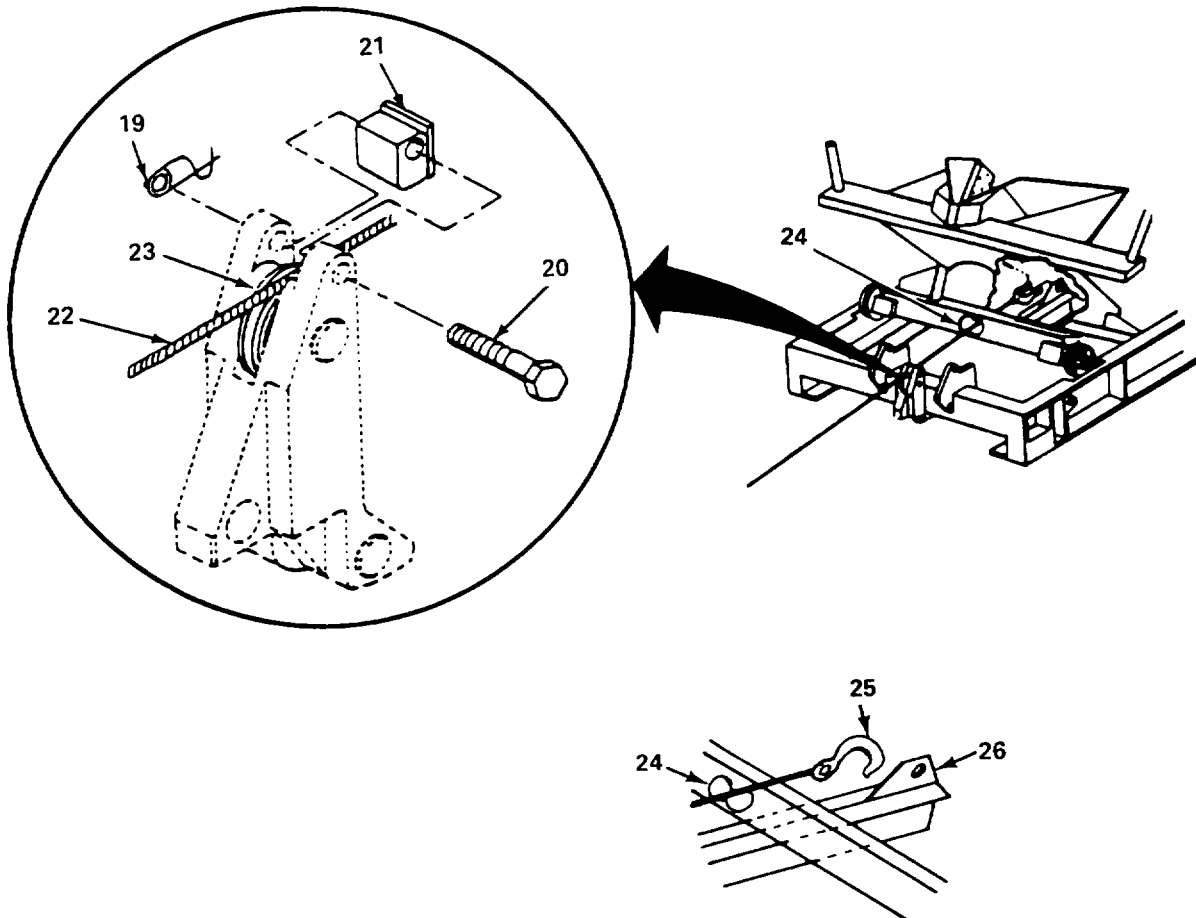
k. Push the hydraulic pin lever to release the pin and allow the cradle to roll off into the water. Push the boom control lever to raise the boom no more than 3 feet. Cradle will rest against the rear stop brackets.

l. After the boat is launched, release safety line and release the brakes. Drive the transporter forward slowly until the cradle is clear of the water.



2-10. LAUNCHING, FAST WATER - Continued

m. Remove retainer (19) from bolt (20); remove bolt (20) from retainer block (21). Place winch cable (22) on sheave (23), and thread it through hole in dolly crossmember (24); connect hook (25) to face of dolly (26). Align winch cable (22) on sheave (23); install retainer block (21), bolt (20); and retainer (19).



n. Rewind the boom cable and retract the dolly until it is fully forward. Continue to rewind the cable and adjust the boom until the cradle is fully on the transporter.

o. Disengage the power take-off and return the transporter to shore.

2-23/(2-24 Blank)

CHAPTER 3 UNIT MAINTENANCE INSTRUCTIONS

INDEX

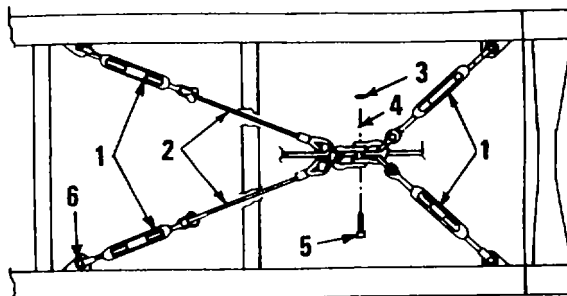
TITLE	SECTION	PAGE
Service Upon Receipt of Materiel	I	3-1
Repair Parts, Special Tools, and Equipment	II	3-3
Lubrication Instructions	III	3-3
Unit Preventive Maintenance Checks and Services (PMCS)	IV	3-4
Troubleshooting	V	3-6
Maintenance	VI	3-8

Section I. SERVICE UPON RECEIPT OF MATERIEL

3-1. UNPACKING AND CHECKING THE EQUIPMENT

The rear stanchions are banded to the inside of the cradle frame. The roller assemblies and the rear stanchion brackets are banded to the dolly assembly.

- a. Remove any metal strapping, tapes, wrapping paper, or any other shipping and protective items.
- b. Inspect the equipment for damage incurred during shipping. If the equipment has been damaged, report the damage on DD Form 6, Packaging Improvement Report.
- c. Check the equipment against the packing slip to see if the shipment is complete. Army users report discrepancies in accordance with the instructions in DA Pamphlet 738-750. MC users report discrepancies in accordance with MCO P 4610-19.
- d. Check to see whether the equipment has been modified.
- e. Perform the following at the cradle:
 - (1) Loosen turnbuckle (1) on the lashing cable (2).
 - (2) Remove cotter pin (3) washer (4) and straight pin (5). Remove turnbuckle pins (6) and store cable assemblies on transporters.

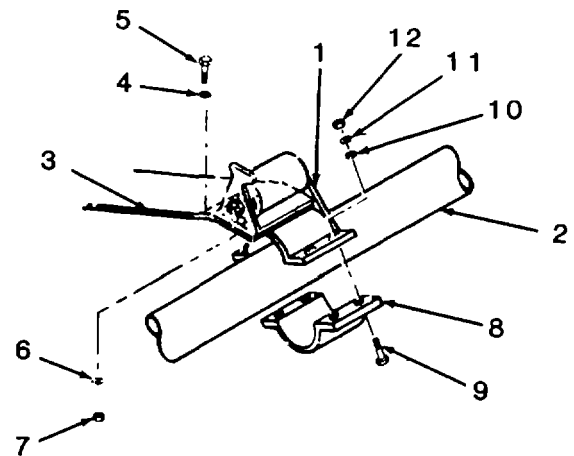
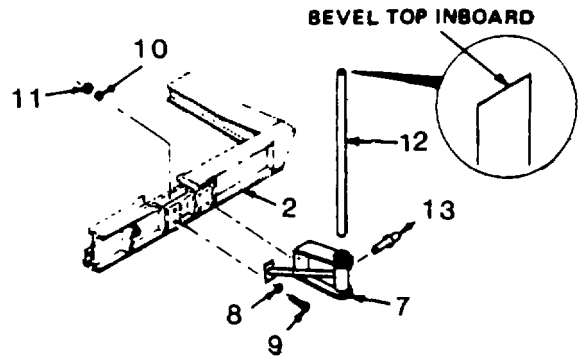


3-1. UNPACKING AND CHECKING THE EQUIPMENT - Continued

- (3) Install left and right stanchion base (7) with flat washers (8) and bolt (9), lockwashers (10) and nuts (11).
- (4) Install rear stanchion (12) with beveled top facing inboard, secure stanchions with pin (13).

f. Perform the following at the transporter:

- (1) Install the left and right upper half of the inboard roller assemblies (1) on the rear of transporter (2). Secure upper half of roller (1) to base of boom (3) with washer (4), bolts (5), lockwashers (6) and nuts (7).
- (2) Install lower half of inboard roller assemblies (8) with bolts (9), flatwashers (10), lockwashers (11) and nuts (12).



3-2. SERVICING THE EQUIPMENT

- a. Perform the preventive maintenance checks and services contained in the PMCS Table.
- b. Lubricate all points as shown in LO 5-2090-202-12/LI 2090-12.
- c. Schedule the next preventive maintenance checks and services on DD Form 314, Preventive Maintenance Schedule and Record.
- d. Report all deficiencies on SF 368 if the deficiencies appear to involve unsatisfactory design. Marine Corps users submit forms as prescribed by TM 4700-15/1.

Section II. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

3-3. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-4. SPECIAL TOOLS AND EQUIPMENT

There are no special tools or equipment necessary for support of this item.

3-5. REPAIR PARTS

Repair parts are illustrated in Appendix C of this manual.

Section III. LUBRICATION INSTRUCTIONS

3-6. GENERAL

Keep all lubricants in closed containers and store in a clean, dry place away from external heat. Keep container covers clean and do not allow dust, dirt, or other foreign material to mix with the lubricants. Keep all lubrication equipment clean and ready for use.

3-7. CLEANING

Keep all external parts, not requiring lubrication, free of lubricants. Before lubricating the equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after servicing to prevent accumulation of foreign matter.

3-8. LUBRICATION POINTS

Service the lubrication points at the proper intervals as specified in the lubrication order. The intervals specified are based on operation under normal conditions. Modifications of the recommended intervals may be required under unusual operating conditions.

3-9. LUBRICATION ORDER

For lubrication, refer to L05-2090-202-12/LI 2090-12/1. See Appendix A.

Section IV. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-10. INTRODUCTION



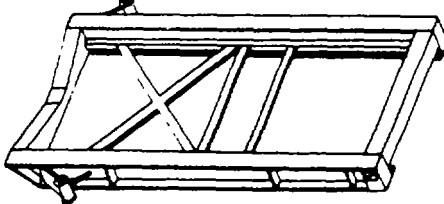
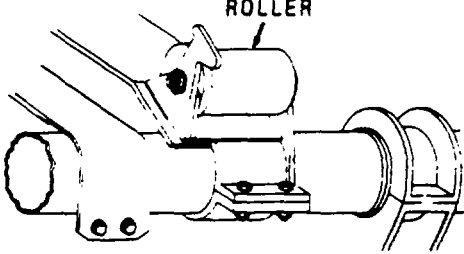
Perform the preventive maintenance checks and services in the following tables as specified. Report any deficiencies in accordance with DA Pamphlet 738-750.

Any surfaces where corrosion is detected should be treated, primed, and coated in accordance with TM 43-0139, using Items 3-6, Appendix F, within 6 months. In saltwater or high-humidity environments, or during periods of frequent precipitation (3 or more times per week), increase frequency of inspection from quarterly to monthly, and correct corrosion within one month of detection. Where corrosion recurs in subsequent inspections after correction, retreat, prime and coat AND submit SF 368, Product Quality Deficiency Report (QDR), indicating that recurrent corrosion is a problem. Try to be specific as to where it is occurring, and what type of corrosion is occurring (e.g. pitting, rust, bubbling). Whenever possible, include color photos of the corroded area to facilitate investigation of the problem.

NOTE

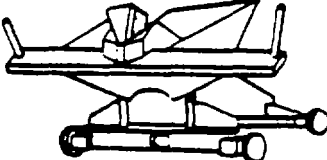
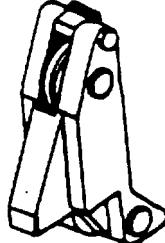
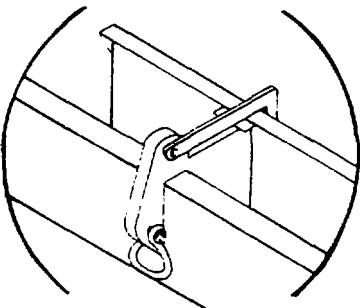
The presence of the boat on the cradle makes thorough inspection difficult. Therefore, the cradle inspection should be done after the boat has been launched.

UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES
QUARTERLY

ITEM NO.	ITEM TO BE INSPECTED PROCEDURE
1	<p>CABLE AND ROPE ASSEMBLIES. Inspect for excessively worn ropes, cables, and rope sleeves. Inspect turnbuckles for freedom of movement. Replace any corroded part which is either corroding an attaching part or which may not be able to withstand operational stresses.</p> 
2	<p>RUBBER RAILS. Inspect the cradle for worn or loose rubber pads.</p> 
3	<p>FRAME. Inspect frame for cracks, corrosion, dents, or other damage. Treat corroded or exposed metal surfaces in accordance with TM 43-0139.</p> 
4	<p>ROLLERS. Inspect for worn, missing, or damaged parts. Replace corroded items which are either corroding attaching parts or which may not be able to withstand operational stresses.</p> 

UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued

QUARTERLY

ITEM NO.	ITEM TO BE INSPECTED PROCEDURE
5	<p>DOLLY ASSEMBLY. Inspect for worn, bent, or damaged roller axle and saddle pivot shaft. Check for missing or loose hardware and parts. Inspect metal on saddle. If it is wearing where boat nose and saddle surface mate, check the rubber pads on the saddle to make sure they are in place and intact. Treat, prime, and coat in accordance with TM 43-0139.</p> 
6	<p>CABLE BLOCK. Inspect cable block for damaged, worn, or missing parts.</p> 
7	<p>DOLLY RETAINER. Inspect for worn, bent, or damaged parts.</p> 

Section V. UNIT TROUBLESHOOTING

3-11. TROUBLESHOOTING TABLE

Common malfunctions which may be found during the operation or maintenance of the boat cradle or its components are listed below. You should perform the tests/inspections and corrective actions in the order listed. This manual cannot list all malfunctions that may occur. If a malfunction is not corrected by the corrective actions listed, notify your superior.

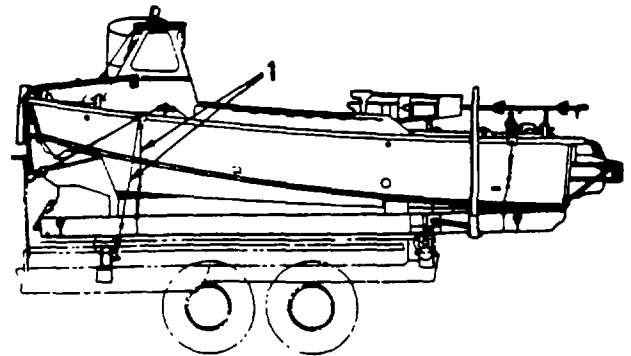
Troubleshooting Table

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DOLLY BINDS OR WILL NOT TRAVEL.

Step 1. Check the forward tie-down pin on the transporter in accordance with TM 5-5420-209-12.

- If the pin is not released, release the pin in accordance with TM5-5420-209-12.
- If the pin is released, proceed to step 2.



Step 2. Check that the tie-down cables (1) are removed.

- If tie-down cables are not removed, remove cables in accordance with para. 2-5b.
- If tie-down cables are removed proceed to Step 3.

Step 3. Check for debris wedged between dolly wheels and beams of wheels.

- If debris is present, secure dolly in accordance with para. 2-7d and remove debris.
- If debris is not present, proceed to Step 4.

Step 4. Check that the boom is raised about three feet.

- If the boom is not elevated to three feet, raise the boom three feet in accordance with para. 2-7e.
- If the boom is elevated three feet, proceed to Step 5.

Step 5. Check for seized dolly wheel.

- If dolly wheel is seized, lubricate wheel.
- If lubrication does not correct malfunction, remove and replace wheels as needed.

Section VI. UNIT MAINTENANCE

TITLE	INDEX	PAGE
Tie-down Cable Assemblies		3-8
Latch Block Roller Assembly		3-12
Rear Stanchion and Base Assembly.....		3-21
Dolly Retainer Latch.....		3-24
Stop Pins		3-27
Rear Rubber Pads and Rails		3-29
Dolly Assembly		3-32
Roller Assembly (Transporter).....		3-43

This section contains information on the removal, inspection, cleaning, repair, or replacement and installation (where authorized by the MAC Chart in Appendix B), of the following items at the unit level:

- | | |
|--------------------------------------|-----------------------------------|
| a. Tie-down cable assemblies | e. Stop pins. |
| b. Latch block roller assembly | f. Rear rubber pad and rails. |
| c. Rear stanchion and base assembly. | g. Dolly assembly. |
| d. Dolly retainer latch. | h. Roller assembly (transporter). |

3-12. TIE-DOWN CABLE ASSEMBLIES-MAINTENANCE INSTRUCTIONS

This task covers:

- | | |
|---------------|-----------------|
| a. Removal | d. Repair |
| b. Cleaning | e. Installation |
| c. Inspection | |

INITIAL SETUP

Equipment
Condition
Para

Condition Description

None

None

3-12. TIE-DOWN CABLE ASSEMBLIES MAINTENANCE INSTRUCTIONS - Continued

INITIAL SETUP - Continued

Materials/Parts

Cleaning solvent
(Federal specification P-D-680)
Bristle brush
Wire brush

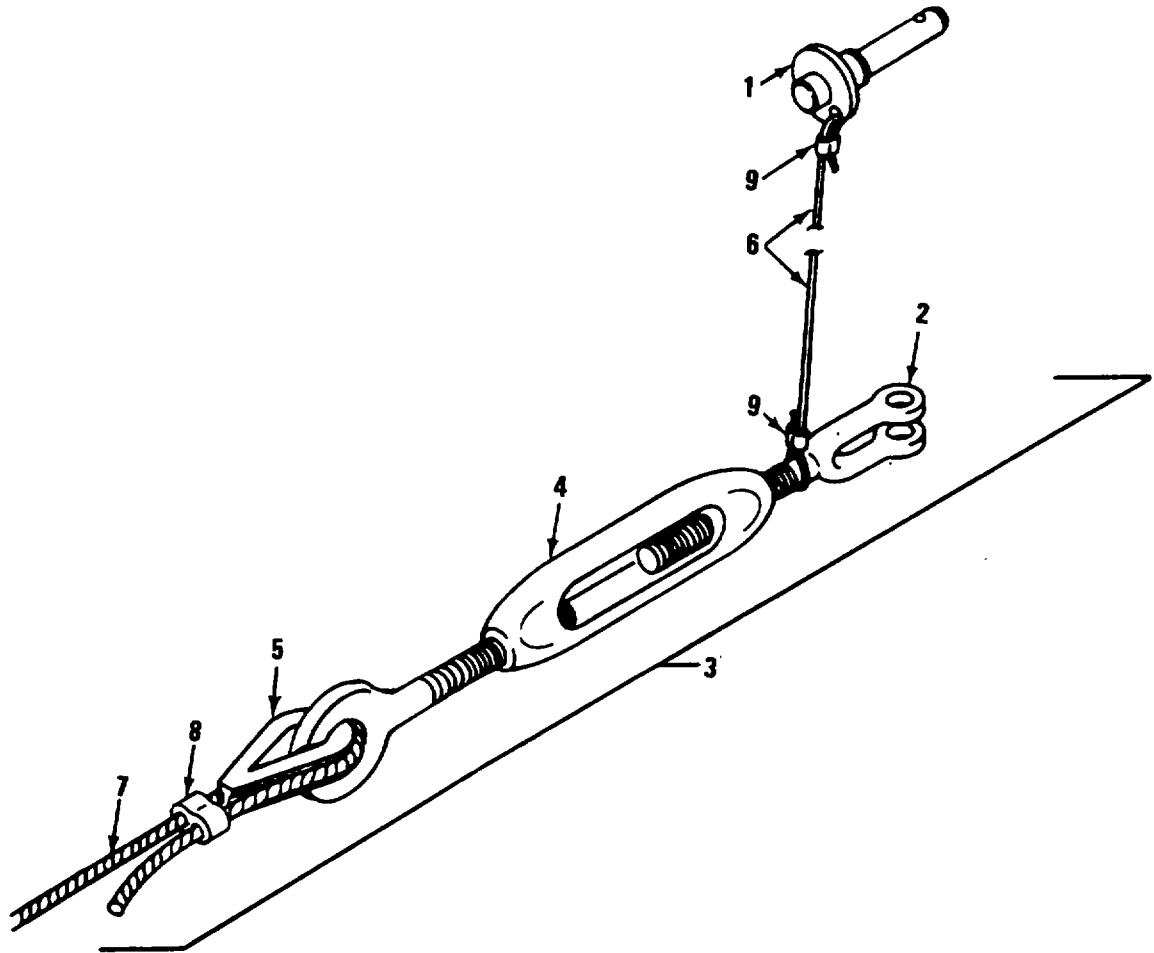
LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
1. Tie-down		
a. Quick release pin (1)	Remove	Repeat procedures in this paragraph for other five tie-down cables as needed.
b. Clevis (2)	Disconnect	
c. Cable assembly (3)	Remove	
CLEAN, INSPECT AND REPAIR		
2. Quick release pin (1) turnbuckle (4), and thimble (5)	a. Inspect for wear, breaks b. Replace part if it shows any of these defects.	

3-12. TIE-DOWN CABLE ASSEMBLIES MAINTENANCE INSTRUCTIONS - Continued

LOCATION/ITEM	ACTION	REMARKS
CLEAN, INSPECT AND REPAIR - CONTINUED		
3. Wire rope (6 and 7)	a. Inspect for: Wear, breaks, fraying b. Replace cable assy if wire rope (7) shows any of these defects. c. Replace wire rode (6) and swaging sleeve (9) if wire rope (6) shows any of these defects.	Cut wire rope to 9-inches
WARNING Cleaning solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of solvent vapors. Keep solvent away from open flame. Do not use in excessive amounts.		
4. Cable assembly (3)	a. Remove dirt, grease, etc. with wire brush. Clean cable assembly using a medium bristle brush and cleaning solvent. b. Allow to Dry.	
INSTALLATION CAUTION For rear cable assemblies only, ensure rear corner bracket is in place on boat hull.		
5. Cable assembly (3)	Install cable assembly into position.	
6. Quick release pin (1)	Install pin	
7. Turnbuckle (4)	Tighten	

3-12. TIE-DOWN CABLE MAINTENANCE INSTRUCTIONS - Continued

1. QUICK RELEASE PIN
2. CLEVIS
3. CABLE ASSEMBLY
4. TURNBUCKLE
5. THIMBLE
6. WIRE ROPE
7. WIRE ROPE
8. SWAGING SLEEVE
9. SWAGING SLEEVE



3-13. LATCH BLOCK ROLLER ASSEMBLY MAINTENANCE INSTRUCTIONS

This task covers:

- | | |
|---------------|-----------------|
| a. Removal | d. Repair |
| b. Cleaning | e. Installation |
| c. Inspection | |

INITIAL SETUP

Equipment
Condition
Para

Condition Description

2-8

Cradle unloaded from transporter
Boat unloaded from cradle

Materials/Parts

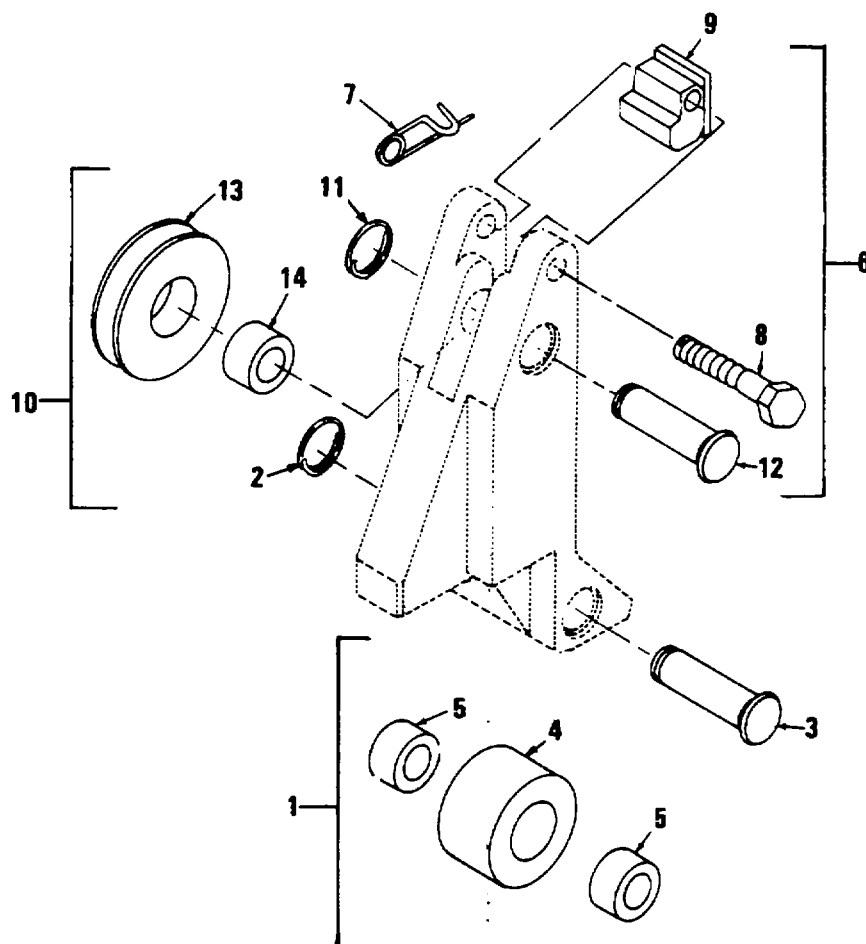
Cleaning solvent
(Federal specification P-D-680)
Bristle brush
Wire brush

LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
1. Roller assembly (1)		
a. Retaining ring (2)	Remove	
b. Axle (3)	Remove	
c. Roller (4), Bearing (5)	Remove	

3-13. LATCH BLOCK ROLLER ASSEMBLY MAINTENANCE
INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
2. Latch assembly (6)		
a. Retainer (7)	Remove	
CAUTION		
Do not use hammer to force capscrew. Doing so burrs aluminum, making capscrew more difficult to remove.		
b. Capscrew (8)	Remove	
c. Latch (9)	Remove	
3. Sheave assembly (10)		
a. Retaining ring (11)	Remove	
b. Axle (12)	Remove	
c. Sheave (13) and bearings (14)	Remove	

3-13. LATCH BLOCK ROLLER ASSEMBLY MAINTENANCE
INSTRUCTIONS-Continued

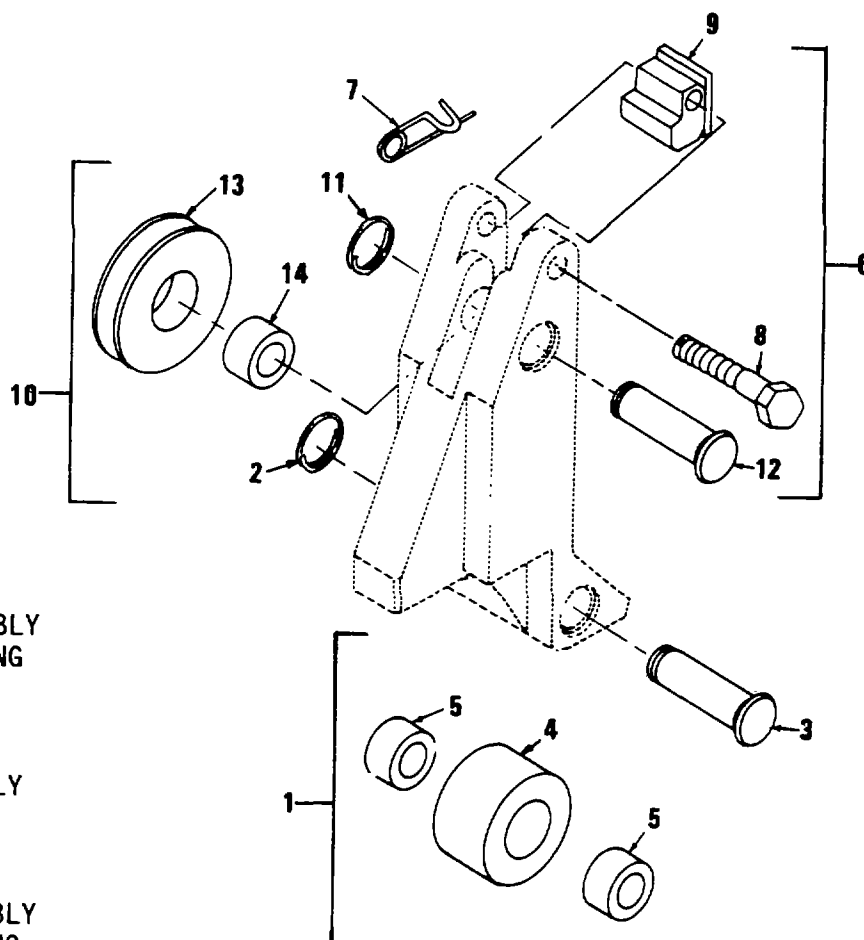


1. ROLLER ASSEMBLY
2. RETAINING RING
3. AXLE
4. ROLLER
5. BEARINGS (2)
6. LATCH ASSEMBLY
7. RETAINER
8. CAP SCREW
9. LATCH
10. SHEAVE ASSEMBLY
11. RETAINING RING
12. AXLE
13. SHEAVE
14. BEARING

3-13. LATCH BLOCK ROLLER ASSEMBLY MAINTENANCE
INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
CLEANING, INSPECTION, AND REPAIR		
4. Roller assembly (1), retaining ring (2), axle (3), roller (4), and bearings (5)	a. Inspect for: wear, missing or damaged parts b. Replace part if it shows any of these defects or is missing	
5. Latch assembly (6) retainer (7), cap screw (8), latch (9)	a. Inspect for: wear, missing or damaged parts b. Replace part if it shows any of these defects or is missing	
6. Sheave assembly (10) retaining ring (11) axle (12), sheave (13), and bearing (14)	a. Inspect for: wear, missing or damaged parts b. Replace part if it shows any of these defects or is missing	

3-13. LATCH BLOCK ROLLER ASSEMBLY MAINTENANCE
INSTRUCTIONS-Continued



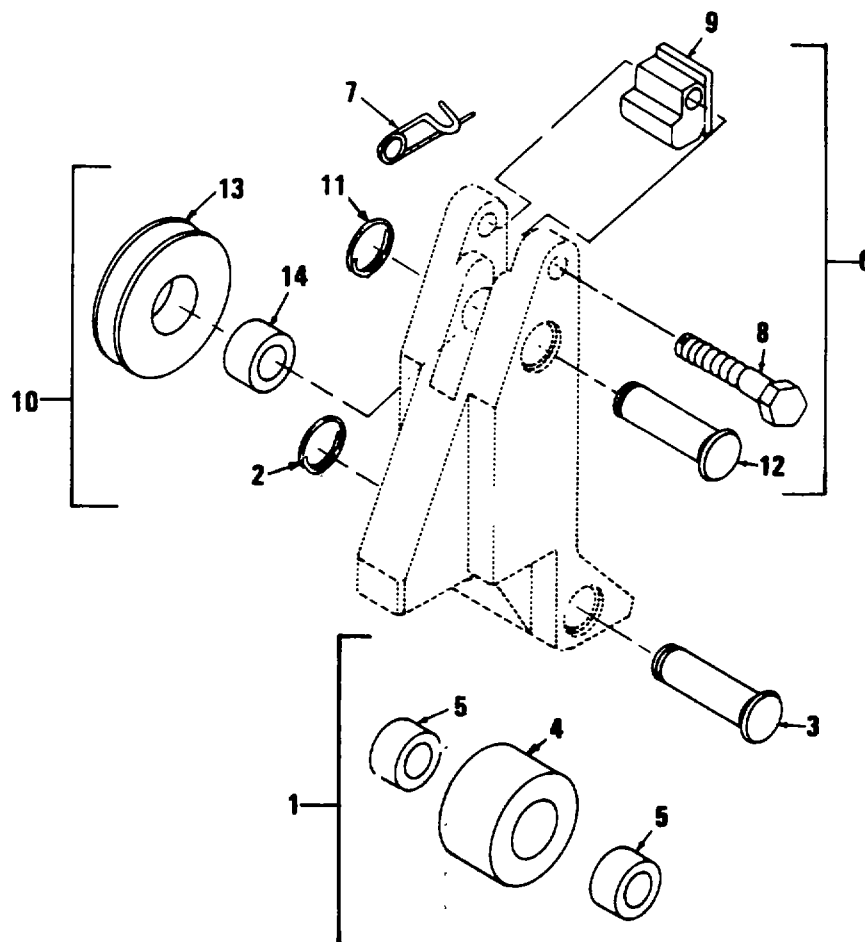
1. ROLLER ASSEMBLY
2. RETAINING RING
3. AXLE
4. ROLLER
5. BEARINGS (2)
6. LATCH ASSEMBLY
7. RETAINER
8. CAP SCREW
9. LATCH
10. SHEAVE ASSEMBLY
11. RETAINING RING
12. AXLE
13. SHEAVE
14. BEARING

3-13. LATCH BLOCK ROLLER ASSEMBLY MAINTENANCE
INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
<p>CLEANING, INSPECTION, AND REPAIR</p> <p style="text-align: center;">WARNING Cleaning solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of solvent vapors. Keep solvent away from open flame. Do not use in excessive amounts.</p>		
<p>7. Roller assembly (1), latch assembly (6), and sheave assembly (10)</p>	<p>Remove dirt, grease, etc. with wire brush. Clean assemblies using a medium bristle brush and cleaning solvent. Allow to dry.</p>	

3-13. LATCH BLOCK ROLLER ASSEMBLY MAINTENANCE
INSTRUCTIONS-Continued

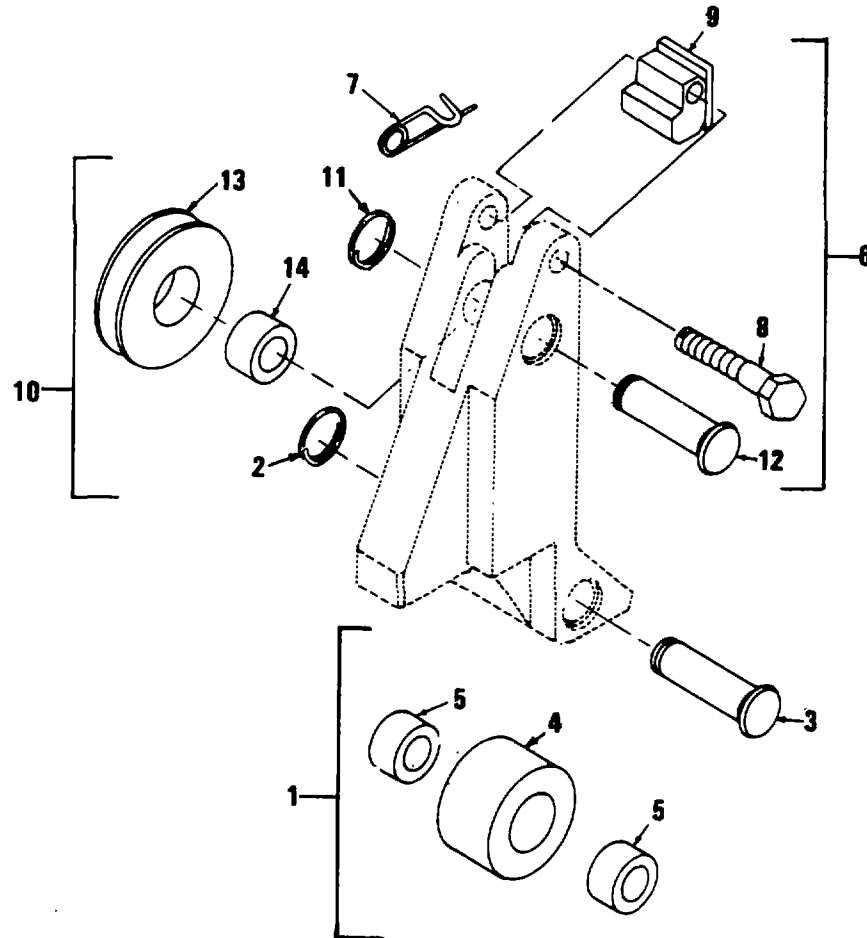
- 1. ROLLER ASSEMBLY
- 6. LATCH ASSEMBLY
- 10. SHEAVE ASSEMBLY



3-13. LATCH BLOCK ROLLER ASSEMBLY AND SHEAVE-MAINTENANCE
INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
INSTALLATION		
8. Roller assembly (1)		
a. Bearing (5) and roller (4)	Place bearing in roller. Position roller in cable block assembly.	
b. Axle (3)	Install	
c. Retaining ring (2)	Install	
9. Sheave assembly (10)		
a. Bearing (14) and sheave (13)	Place bearing in sheave. Position sheave in cable block assembly.	
b. Axle (12)	Install	
c. Retaining ring (11)	Install	
10. Latch assembly (6)		
a. Latch (9)	Position latch in cable block assembly.	
b. Cap screw (8)	Install	
c. Retainer (7)	Install	

3-13. LATCH BLOCK ROLLER ASSEMBLY MAINTENANCE
INSTRUCTIONS-Continued



1. ROLLER ASSEMBLY
2. RETAINING RING
3. AXLE
4. ROLLER
5. BEARINGS (2)
6. LATCH ASSEMBLY
7. RETAINER
8. CAP SCREW
9. LATCH
10. SHEAVE ASSEMBLY
11. RETAINING RING
12. AXLE
13. SHEAVE
14. BEARING

3-14. REAR STANCHION AND BASE ASSEMBLY-MAINTENANCE INSTRUCTIONS

This task covers:

- | | |
|---------------|-----------------|
| a. Removal | d. Repair |
| b. Cleaning | e. Installation |
| c. Inspection | |

INITIAL SETUP

Equipment
Condition
Para

Condition Description

2-7

Cradle unloaded from transporter

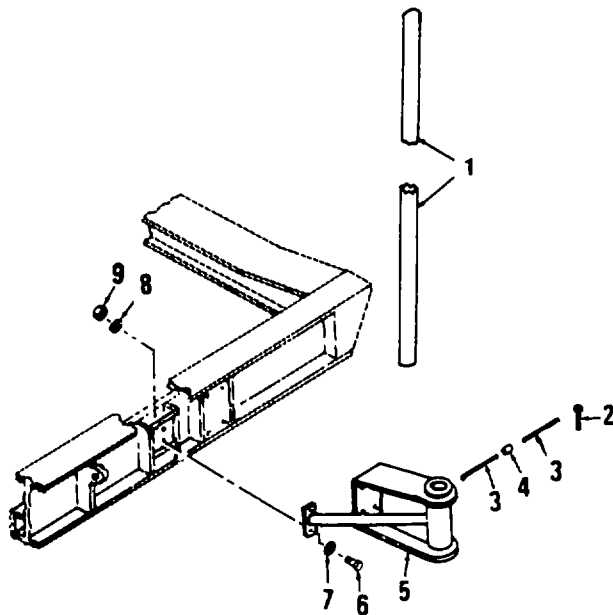
LOCATION/ITEM	ACTION	REMARKS
<p style="text-align: center;">NOTE Refer to paragraph 3-18 for front stanchions located on the dolly assembly.</p>		
<p>REMOVAL</p> <p>1. Stanchion Stanchion (1)</p>	<p>Pull quick release pin (2) and remove stanchion</p>	

**3-14. REAR STANCHION AND BASE ASSEMBLY-MAINTENANCE
INSTRUCTIONS-Continued**

LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
2. Base assembly		
a. Wire rope (3), swaging sleeve (4), and quick release pin (2)	Remove	
b. 6 nuts (9), lockwashers (8), washer (7), and screws (6)	Remove	
c. Base (5)	Remove	Repeat steps 1 and 2 other side.
CLEANING, INSPECTION, AND REPAIR		
3. Stanchion and base assembly	Inspect for cracks, bends, signs of damage.	
a. Stanchion (1)	Replace stanchion if it shows any of these defects.	
b. Base assembly	Inspect for cracks, dents, loose or missing parts. Replace part if it shows any of these defects or is missing.	Repeat steps (a) and (b) for other side.

**3-14. REAR STANCHION AND BASE ASSEMBLY-MAINTENANCE
INSTRUCTIONS-Continued**

LOCATION/ITEM	ACTION	REMARKS
INSTALLATION 4. Base assembly a. Base (5) b. 6 screws (6), washers (7), lockwashers (8), and nuts (9) c. Wire rope (3), swaging sleeve (4) and quick release pin (2) 5. Stanchion Stanchion (1)	Position base on frame.	
	Install	
	Install	
	Install stanchion in base and replace quick release pin	Repeat steps 4 and 5 for other side.



1. STANCHION
2. QUICK RELEASE PIN
3. WIRE ROPE
4. SWAGING SLEEVE
5. BASE
6. SCREW
7. WASHER
8. LOCKWASHER
9. NUT

3-15. DOLLY RETAINER LATCH MAINTENANCE INSTRUCTIONS I

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Installation

INITIAL SETUP

Equipment
Condition
Para

2-7, 2-8

Condition Description

Cradle unloaded from transporter
Boat unloaded from cradle

LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
1. Dolly Retainer Latch		
a. Nut (1), washers (2) and screw (3)	Remove	
b. Latch (4)	Remove	

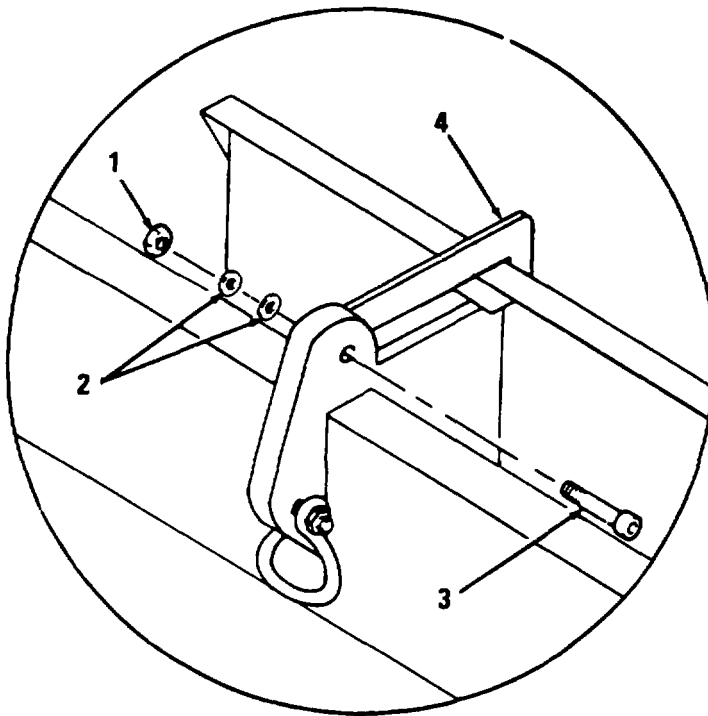
3-15. DOLLY RETAINER LATCH MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
CLEANING AND INSPECTION	2. Dolly retainer	
	a. Inspect for: wear, bent or damaged parts	
	<p>WARNING Cleaning solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of solvent vapors. Keep solvent away from open flame. Do not use in excessive amounts.</p>	
	b. Remove dirt, grease, etc. with wire brush. Clean assembly using a medium bristle brush and cleaning solvent.	
	c. Allow to dry.	

3-15. DOLLY RETAINER LATCH MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
INSTALLATION		
3. Latch		
a. Latch (4)	Position latch	
b. Screw (3), washers (2), and nut (1).	Install	

1. NUT
2. WASHERS
3. SCREW
4. LATCH



3-16. STOP PINS MAINTENANCE INSTRUCTIONS

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Equipment
Condition
Para

2-7, 2-8

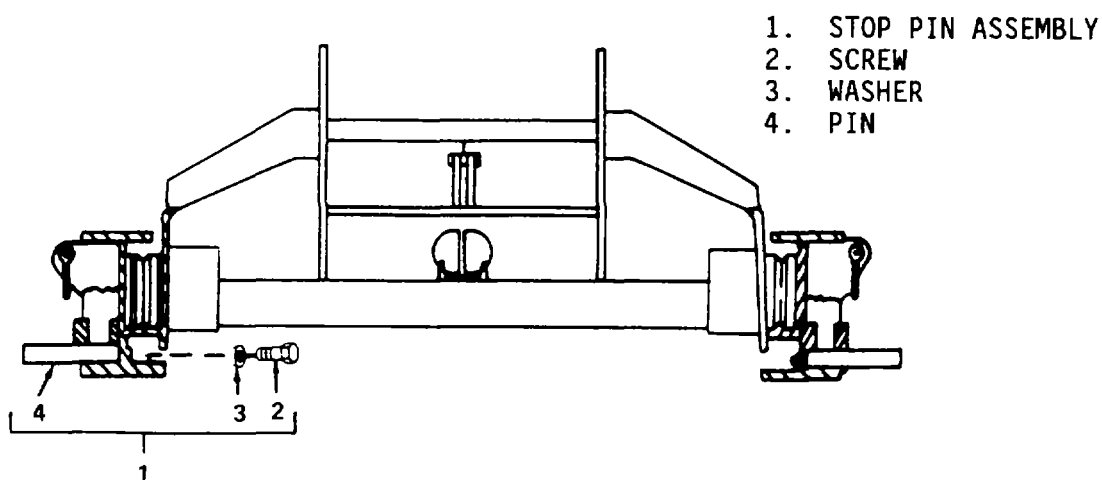
Condition Description

Cradle unloaded from transporter
boat unloaded from cradle

LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
1. Stop pin assembly (1)		
a. Screw (2) and washer (3)	Remove	
b. Pin (4)	Remove	Repeat steps a and b for other stop pin assemblies

3-16. STOP PINS MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
INSPECTION AND REPAIR 2. Stop pin assembly (1)	a. Inspect for: wear, bent or missing parts b. Replace part if it shows any of these defects or is missing	Repeat steps a and b for other stop pin assemblies
INSTALLATION 3. Stop pin assembly a. Pin (4) b. Washer (3) and screw (2)	Install Install	



3-17. REAR RUBBER PADS AND RAILS MAINTENANCE INSTRUCTIONS

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Installation

INITIAL SETUP:

Equipment
Condition
Para

2-7, 2-8

Condition Description

Cradle unloaded from transporter
Boat unloaded from cradle

Materials/Parts

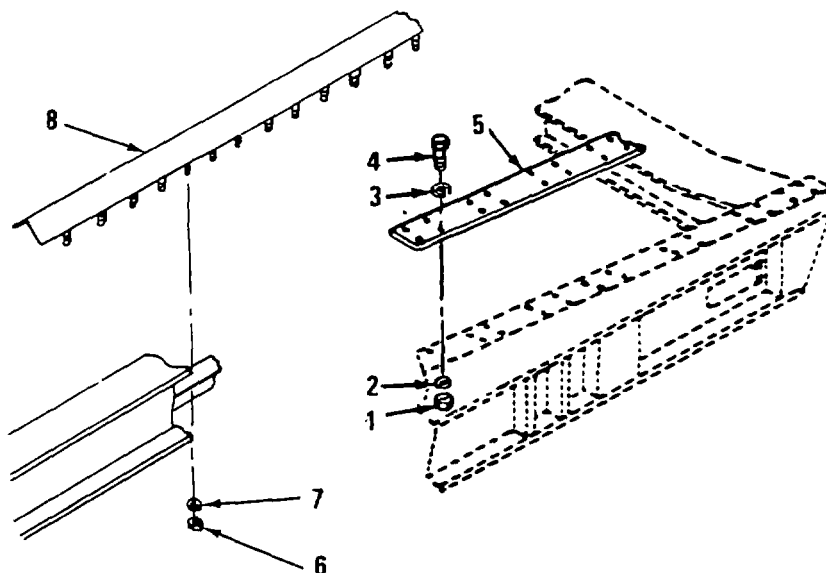
Cleaning solvent
(Federal Specification
P-D-680)
Soft Cloth
Mild Soap
Adhesive

LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
1. Rubber pad		
a. 28 nuts (1), washers (2), washers (3), and screws (4)	Remove	
b. Pad (5)	Scrape off	Repeat steps a and b for other rear pad.
2. Rail		
a. 23 nuts (6) 23 lockwashers (7)	Remove	
b. Rail (8)	Remove	Repeat steps a and b for other rear pad.

3-30

3-17. REAR RUBBER PADS AND RAILS MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
INSTALLATION 4. Rubber pad a. Pad (5) b. 28 screws (4), washers (3), washers (2), and nuts (1) 5. Rail (8), 23 lockwashers (7) and 23 nuts (6)	a. Remove all old adhesive to bare metal b. Apply adhesive to pad c. Install pad Install	Repeat steps a and b for other rear pad. Make sure bolt heads are below the rubber pads (5).
	Install	



1. NUT
2. WASHER
3. WASHER
4. SCREW
5. PAD
6. NUT
7. LOCKWASHER
8. RAIL

3-18. DOLLY ASSEMBLY-MAINTENANCE INSTRUCTIONS

This task covers:

- a. Removal
- d. Repair
- b. Cleaning
- e. Installation
- c. Inspection

INITIAL SETUP:

Equipment
Condition
Para

Condition Description

2-7, 2-8

Cradle unloaded from transporter
Boat unloaded from cradle

Materials/Parts
Soft Cloth
Mild Soap
Bristle Brush
Cleaning Solvent
(Federal Specification P-D-680)
Adhesive

3-18. DOLLY ASSEMBLY MAINTENANCE INSTRUCTIONS-Continued

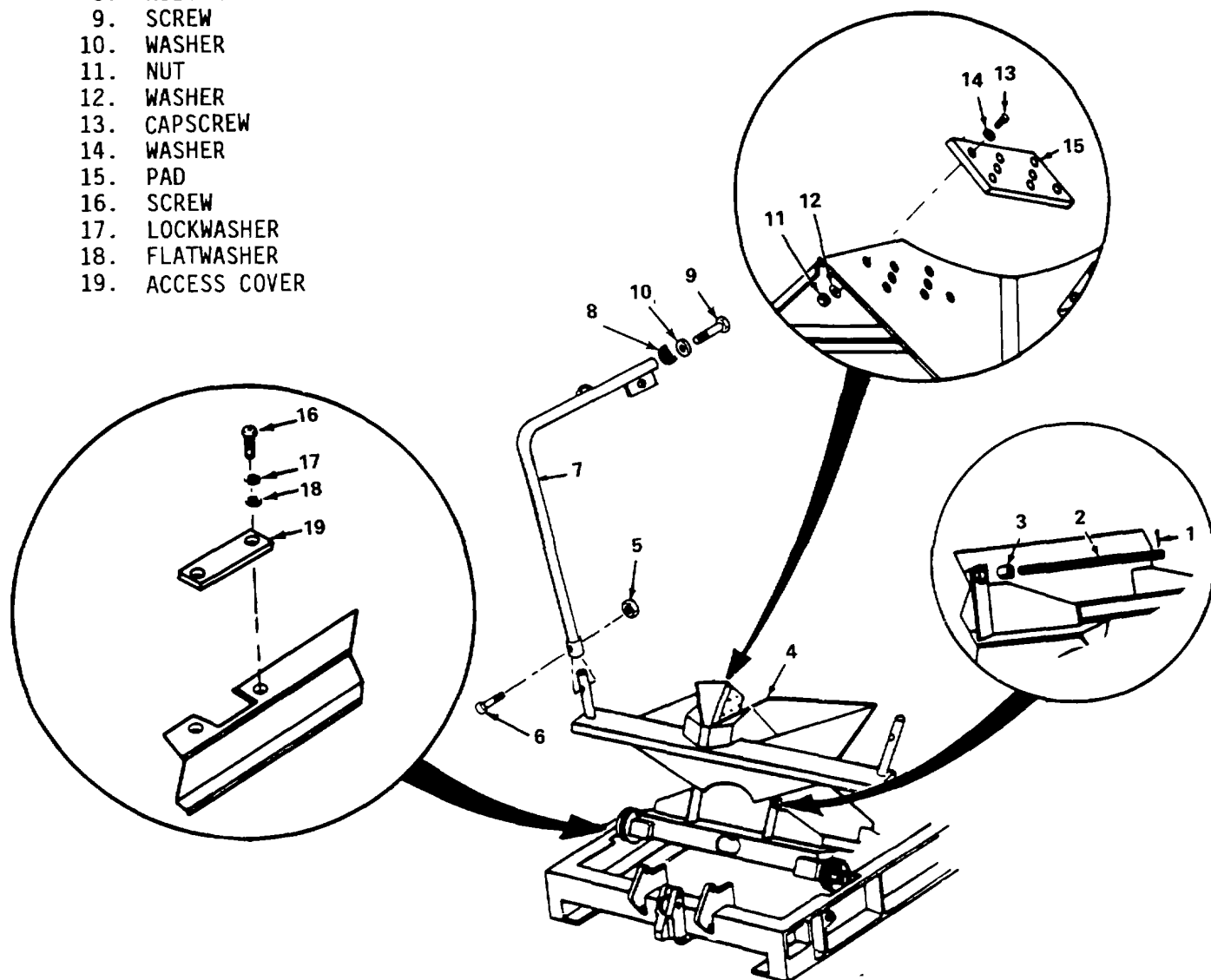
LOCATION/ITEM	ACTION	REMARKS
<p>REMOVAL</p>		
<p>NOTE</p> <p>The saddle is removed from the dolly assembly before the dolly assembly is removed from the cradle. This makes the removal of the dolly from the cradle easier.</p>		
<p>1. Saddle and pivot shaft assembly</p> <p>a. Two cotter pins (1) and shaft (2)</p>		
<p>WARNING</p> <p>Support the saddle when removing shaft. Failure to do so may result in injury to personnel or damage to equipment.</p>		
b. Two spacers (3)	Remove	
c. Saddle (4)	Remove	
2. Stanchions		
a. Nut (5) and bolt (6)	Remove	
b. Stanchion (7)	Remove	
c. Rubber Bumper (8)	Remove screw (9) and washer (10).	Repeat steps a through c for the other stanchion.
3. Saddle rubber pads		
a. 8 nuts (11), lock washers (12), cap-screws (13) and washers (14).	Remove	
b. Pad (15)	Scrape off	Repeat steps a and b for the other pad.

3-18. DOLLY ASSEMBLY-MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
4. Access cover		
a. Two screws (16), lockwashers (17), and flatwashers (18)	Remove	
b. Access cover (19)	Remove	Repeat steps a and b for the other access cover.

3-18. DOLLY ASSEMBLY MAINTENANCE INSTRUCTIONS-Continued

1. COTTER PIN
2. SHAFT
3. SPACER
4. SADDLE
5. NUT
6. BOLT
7. STANCHION
8. RUBBER BUMPER
9. SCREW
10. WASHER
11. NUT
12. WASHER
13. CAPSCREW
14. WASHER
15. PAD
16. SCREW
17. LOCKWASHER
18. FLATWASHER
19. ACCESS COVER



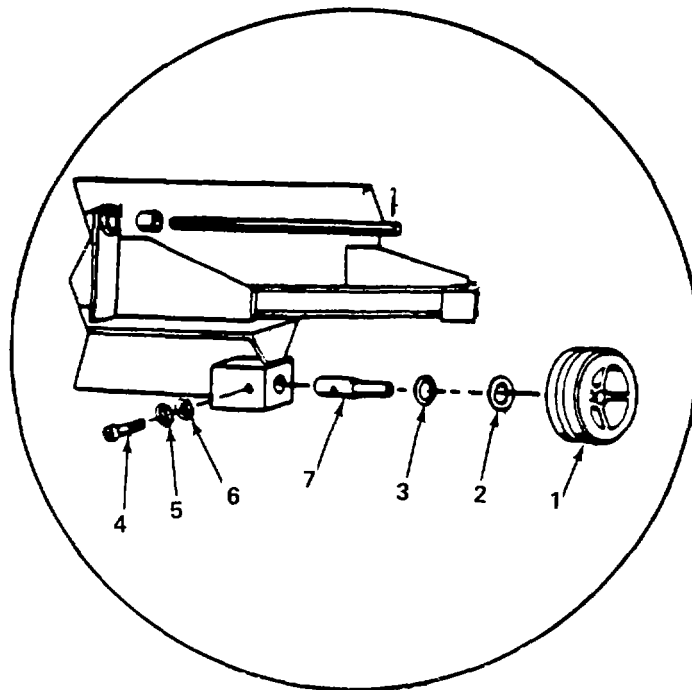
3-18. DOLLY ASSEMBLY MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
REMOVAL 5. Dolly assembly	a. Unlatch dolly and move it so the two front wheels line up with the access cutouts. b. Lift the wheels through the access cutouts. c. Tilt the dolly to a full vertical position. d. Move the dolly so the remaining two wheels line up with access cutouts.	
	<p style="text-align: center;">CAUTION</p> <p>Get help when lifting dolly out of cradle base; dolly is heavy and takes two people to lift.</p> e. Lift the dolly up and away from the cradle and set on dunnage.	

3-18. DOLLY ASSEMBLY MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
6. Wheel assembly		
a. Wheel (1), shim (2) if installed and washer (3)	Remove	
b. Screw (4), lockwasher (5), flatwasher (6)	Remove	
c. Axle (7)	Remove	Repeat steps a through c for the other wheels.

1. WHEEL
2. SHIM
3. WASHER
4. SCREW
5. LOCKWASHER
6. FLATWASHER
7. AXLE



3-18. DOLLY ASSEMBLY-MAINTENANCE INSTRUCTIONS-Continued

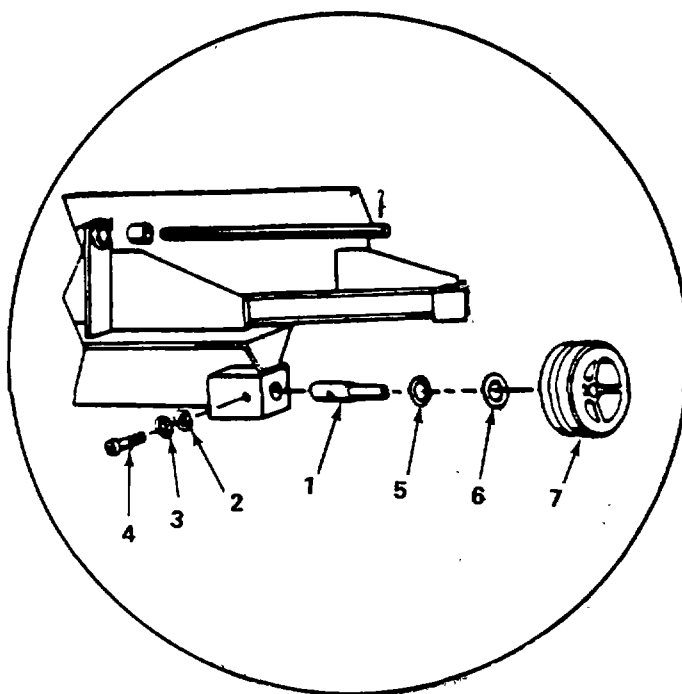
LOCATION/ITEM	ACTION	REMARKS
CLEANING, INSPECTION, AND REPAIR		
7. Saddle and rubber pads	<p>a. Inspect pads. Look for wear down to bolt heads, loose or deteriorated rubber, or tears in excess of three inches.</p> <p>b. Replace if pad shows any of these defects.</p> <p>c. Clean dirt, grease, etc. from pad by wiping with a soft cloth.</p> <p>d. Thoroughly wash pad with water and a mild soap.</p> <p>e. Rinse off all soap with water.</p> <p>f. Allow to dry.</p>	<p>Make sure bolt heads are below the rubber pad.</p> <p>Removal instructions paragraph 3-18, 3</p> <p>Repeat steps a through f for the other pad.</p>
8. Stanchions	Inspect for cracks, dents, or signs of damage. Replace if any defects are found.	
9. Dolly assembly		
a. Saddle	<p>a. Inspect for: cracks, dents or signs of damage.</p> <p>b. Replace saddle if it shows any of these defects.</p>	

3-18. DOLLY ASSEMBLY-MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
CLEANING, INSPECTION, AND REPAIR		
b. Wheel assemblies and saddle pivot shaft	a. Inspect for: excessive wear, cracks, dents, loose or missing parts. b. Replace any part if it shows any of these defects or is missing.	
INSTALLATION		
10. Wheel assembly		
a. Axle (1)	Install	
b. Washer (2), lock-washer (3), and screw (4).	Install	
c. Washer (5)	Install	
d. Shim (6)	Add shims as required.	
e. Wheel (7)	Install	

3-18. DOLLY ASSEMBLY-MAINTENANCE INSTRUCTIONS-Continued

1. AXLE
2. FLATWASHER
3. LOCKWASHER
4. SCREW
5. WASHER
6. SHIM
7. WHEEL



3-18. DOLLY ASSEMBLY-MAINTENANCE INSTRUCTIONS-Continued

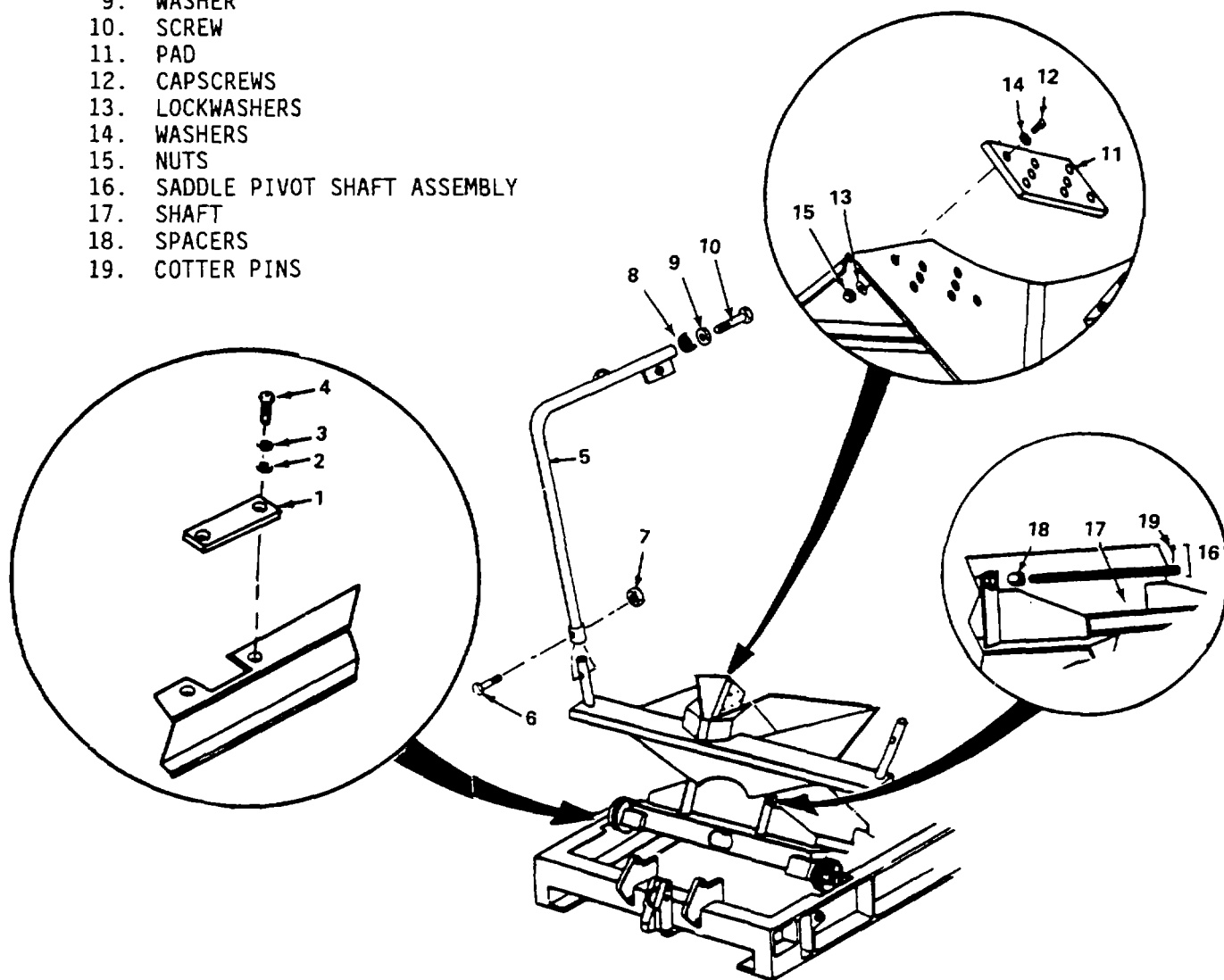
LOCATION/ITEM	ACTION	REMARKS
<p>INSTALLATION</p>		
	<p>CAUTION Get help when installing dolly. It is heavy and takes two people to lift.</p>	
11. Dolly assembly	<p>a. Lower the two rear wheels into the access cutouts.</p> <p>b. Move the dolly so that front wheels line up with the access cutouts and lower front wheels into cradle base. Move dolly to the front of the cradle and hook the retainer latch.</p>	
12. Access cover (1)	Position over access cutout.	
Washers (2), lockwashers (3), and screws (4)	Install	
13. Front stanchions (5)	Install rubber bumpers (8), washer (9), and screw (10). Install stanchions, bolt (6) and nuts (7).	
14. Saddle rubber pads		
a. Pad (11)	<p>a. Remove all adhesive.</p> <p>b. Apply new adhesive to pad.</p> <p>c. Position pad on saddle so that holes on pad align with holes on saddle.</p>	

3-18. DOLLY ASSEMBLY-MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
<p>b. Capscrews (12), lock-washers (13), washers (14), and nuts (15)</p> <p>15. Saddle pivot shaft assembly (16)</p> <p>16. Shaft (17), spacers (18), and cotter pins (19)</p>	<p>Install</p> <p>Position the boat cradle saddle onto the dolly, aligning shaft holes.</p> <p>Install</p>	<p>Repeat steps a through c for the other pad.</p>

3-18. DOLLY ASSEMBLY-MAINTENANCE INSTRUCTIONS-Continued

1. ACCESS COVER
2. WASHERS
3. LOCKWASHERS
4. SCREWS
5. FRONT STANCHIONS
6. BOLT
7. NUT
8. RUBBER BUMPER
9. WASHER
10. SCREW
11. PAD
12. CAPSCREWS
13. LOCKWASHERS
14. WASHERS
15. NUTS
16. SADDLE PIVOT SHAFT ASSEMBLY
17. SHAFT
18. SPACERS
19. COTTER PINS



3-19. ROLLER ASSEMBLY (TRANSPORTER)-MAINTENANCE INSTRUCTIONS

This task covers:

- a. Removal
- d. Repair
- b. Cleaning
- e. Installation
- c. Inspection

INITIAL SETUP:

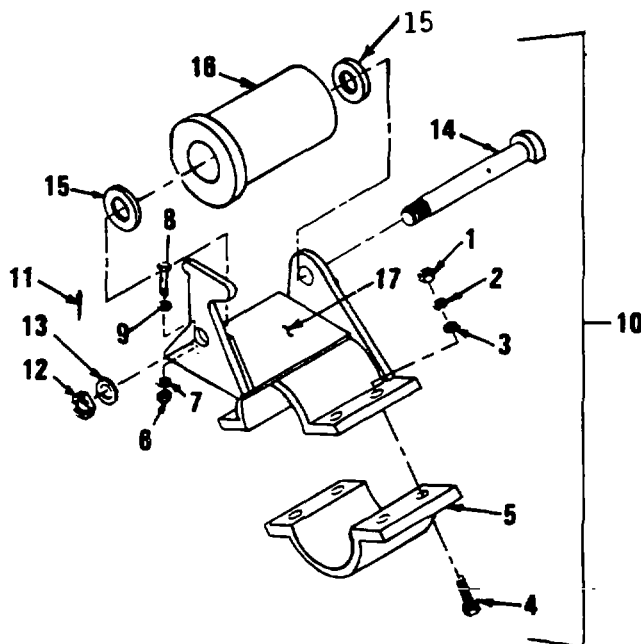
Equipment	
Condition	
<u>Para</u>	<u>Condition Description</u>
2-7	Cradle unloaded from transporter

- Materials/Parts
- Soft Cloth
 - Cleaning solvent
(Federal Specification P-D-680)
 - Bristle brush
(NSN 8020-00-297-6657)

3-19. ROLLER ASSEMBLY (TRANSPORTER)-MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
REMOVAL		
1. Roller assembly	Remove	
a. 4 nuts (1), lock-washers (2), flat washers (3), and screws (4)		
b. Cap (5), Nuts (6), lockwashers (7), screws (8), flat-washers (9) and roller assembly (10)	Remove	
c. Cotter key (11), nut (12), washer (13), axle (14), washers (15), roller (16), and bracket (17)	Remove	Repeat steps a through c for the other side

1. NUT
2. LOCKWASHER
3. WASHER
4. SCREW
5. CAP
6. NUT
7. LOCKWASHER
8. SCREW
9. WASHER
10. ROLLER ASSY.
11. COTTER KEY
12. NUT
13. WASHER
14. AXLE
15. WASHERS
16. ROLLER
17. BRACKET



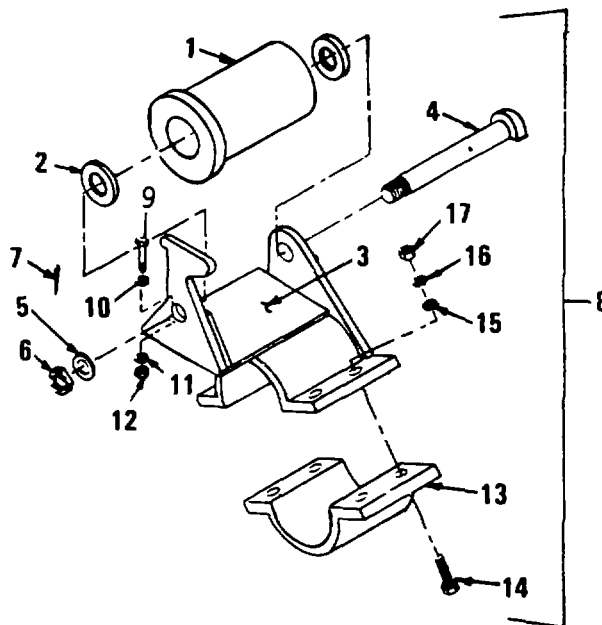
3-19. ROLLER ASSEMBLY (TRANSPORTER)-MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
CLEANING, INSPECTION, AND REPAIR		
2. Roller assembly	a. Inspect for: worn, missing or damaged parts. b. Replace part if it shows any of these defects or is missing. c. Clean dirt, grease, etc. by wiping with a soft cloth.	Bracket may be welded.
WARNING Cleaning solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of solvent vapors. Keep solvent away from open flame. Do not use in excessive amounts.		
	d. Using a clean soft cloth or medium bristle brush and cleaning solvent, clean roller assembly. e. Allow to dry.	Repeat steps a through e for other side.

3-19. ROLLER ASSEMBLY (TRANSPORTER)-MAINTENANCE INSTRUCTIONS-Continued

LOCATION/ITEM	ACTION	REMARKS
INSTALLATION		
3. Roller assembly		
a. Roller (1), and washers (2) and bracket (3)	Position in bracket (3).	
b. Axle (4), washer (5), nut (6), and cotter key (7)	Install	
c. Roller assembly (8) screw (9), washer (10), lockwasher (11), nut (12), cap (13), screws (14), washers (15), lockwashers (16) and nuts (17)	Position roller and bracket assembly onto transporter and install	Repeat steps a through c for other side.

1. ROLLER
2. WASHER
3. BRACKET
4. AXLE
5. WASHER
6. NUT
7. COTTER KEY
8. ROLLER ASSEMBLY
9. SCREW
10. WASHER
11. LOCKWASHER
12. NUT
13. CAP
14. SCREWS
15. WASHERS
16. LOCKWASHERS
17. NUTS



APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals and miscellaneous publications.

A-2. FORMS

Packaging Improvement Report	DD Form 6
Equipment Daily or Monthly Log	DA Form 2408-1
Equipment Daily or Monthly Log	DA Form 2404
Maintenance Request.....	DA Form 2407
Recommended Changes to Technical Publications	NAMC 1077.2
Quality Deficiency Report.....	SF 368
Recommended Changes to DA Publications	DA Form 2028

A-3. TECHNICAL MANUALS

Equipment Record Procedures.....	TM 4700-15/1
Procedures for Rapid Deployment, Redeployment and Retrograde for Military Bridging.....	TM 796-185
Procedures for Destruction of Equipment to Prevent Enemy Use	TM 740-244-3
Operator's Manual, Truck M817	TM 9-2320-260-10
Operator's Manual, Truck M945	TM 9-2320-272-10
Operator's and Organizational Maintenance Manual, Ribbon Bridge Transporter	TM 5-5420-209-12
Painting Instructions for Army Materiel	TM 43-0139

A-4. MISCELLANEOUS PUBLICATIONS

The Army Maintenance Management System (TAMMS)	DA Pamphlet 738-750
Lubrication Order, Cradle, Bridge Erection Boat	LO 5-2090-202-12
Lubrication Instructions, Cradle, Bridge Erection Boat	LI-2090-12/1
Lubrication Order, Truck M817	LO 9-2320-260-12
Lubrication Order, Truck M945	LO 9-2320-272-10
Lubrication Order, Ribbon Bridge Transporter	LO 5-5420-209-12
MC Military Incentive Awards Program.....	MCO 1650.17
Report of Discrepancy in Shipment	MCO P 4610.19

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APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in section II designates overall responsibility for the performance of maintenance functions on the identified end item or component and the work measurement time required to perform the functions by the designated maintenance level. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable like part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see para. B-2.)

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number of complexity of the tasks

within figures will be shown for each level. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C..... Operator or crew.
O..... Organization maintenance.
F..... Direct support maintenance.
H..... General support maintenance.
D..... Depot maintenance.

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

Section II. MAINTENANCE ALLOCATION CHART									
NOMENCLATURE OF END ITEMS:									
(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			UNIT		INTERMEDIATE		DEPOT		
			C	O	F	H	D		
01	Cradle Frame Assembly								
	Cable Assemblies, Tie-down	Inspect Replace Repair	0.1	0.1 1.0 2.0				1	
	Roller Assembly, Latch Block	Inspect Replace Repair	0.1	0.1 0.5 1.0				1 1	
	Rear Stanchion and Base Assembly	Inspect Replace Repair	0.1	0.1 0.4 0.5				1 1	
	Latch, Dolly Retainer	Inspect Replace	0.1	0.1 0.3				1	
	Stop Pins	Inspect Replace Repair	0.1	0.1 0.2 1.0				1 1	
02	Rails and Pads, Rubber Dolly Assembly	Inspect Replace	0.1	0.1 0.2				1	
	Dolly	Inspect Replace	0.1	0.1 0.4				1	
	Saddle and Pads	Inspect Replace Repair	0.1	0.1 0.4 1.0				1 1	
	Front Stanchion	Inspect Replace Repair	0.1	0.1 0.2 0.5				1 1	
	Wheel Assemblies, Shaft, and Thrustwashers	Inspect Service Replace Repair	0.1	0.1 0.1 0.3 1.0				1 1	
03	Roller Assemblies (Transporter)								
	Roller, Axle, and Bracket	Inspect Service Replace Repair	0.1	0.1 0.1 1.0 2.0				1 1	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) REFERENCE CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	0	Tool Kit, General Mechanic, Automotive	5180-00-177-7033	

Section IV. REMARKS
None

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APPENDIX C

REPAIR PARTS AND SPECIAL TOOLS LIST

	Page	Illus Figure
Section I	INTRODUCTION	C-2
Section II	REPAIR PARTS AND SPECIAL TOOLS LIST	C-11
Group 01.	CRADLE FRAME ASSEMBLY	
	Dolly Retainer Latch, Tie Down Cables, Hooks and Shackles	C-10 C-1
	Cable Assembly and Shackles	C-12 C-2
	Latch Block Roller Assembly	C-14 C-3
	Access Cover, Rails, Pads and Data Plate	C-16 C-4
	Stop Pins	C-18 C-5
Group 02.	DOLLY ASSEMBLY	
	Saddle	C-20 C-6
	Dolly	C-22 C-7
	Rear Stanchion and Base Assembly	C-24 C-8
	Front Stanchion	C-26 C-9
	Wheel Assembly, Shaft and Thrustwashers	C-28 C-10
Group 03.	ROLLER AND AXLE ASSEMBLIES	
	Right and Left Hand Roller Assembly	C-30 C-11
Group 04.	BULK MATERIALS	C-32
Section III	SPECIAL TOOLS (Not applicable)	
Section IV	CROSS-REFERENCE	I-1
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	Part Number Index	C-34
	Figure and Item Number Index	C-37

**OPERATOR'S AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)**

**CRADLE, BRIDGE ERECTION
BOAT, TWIN JET, ALUMINUM HULL
(2090-01-106-9789)**

Section I. INTRODUCTION

C-1. SCOPE. This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of Organizational Maintenance of the Lubricating and Servicing Unit. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

C-2. GENERAL. In addition to this section, Introduction, this Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. This list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in item name sequence. Repair parts kits are listed separately in functional groups in Section II. Repair parts for repairable special tools are also listed in this section. Items listed are shown in the associated illustration(s)/figure(s).

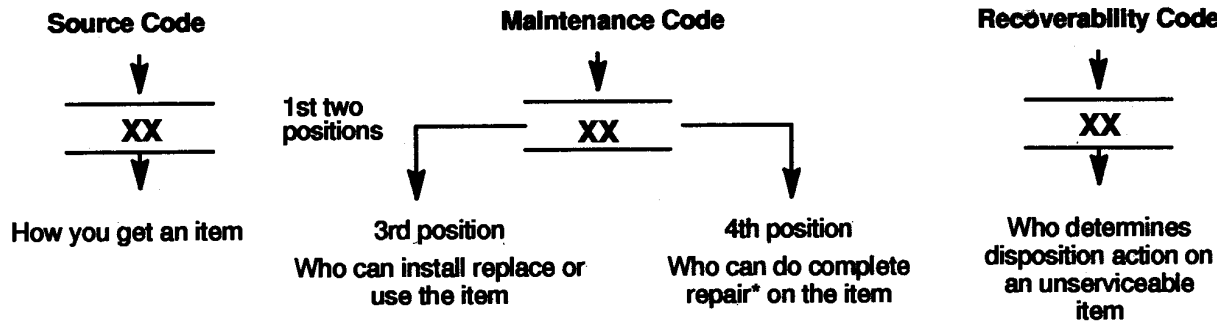
b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance.

c. Section IV. Cross-Reference Index. A list, in National Item Identification Number (NIIN) sequence, of all national stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross referenced to each illustration figure and item number appearance. The figure and item number index lists figure and item numbers in alphanumeric sequence and cross references NSN, FSCM and part number.

C-3. EXPLANATION OF COLUMNS (SECTIONS II AND III).

a. ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

b. SMR Code (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:



NOTE

* Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) **Source Code.** The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow.

Code

Explanation

PA
PB
PC**
PD
PE
PF
PG



Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3rd position of the SMR code.

**NOTE: Items coded PC are subject to deterioration.

KD
KF
KB



Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.

Explanation

MO (Made at org AVUM level)
MF (Made at DS/AVUM level)
MH (Made at GS level)
ML (Made at Specialized Repair Activity (SRA))
MD (Made at Depot)



Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION and USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.

Explanation

AO (Assembled by org AVUM Level)	}	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position code of the SMR code authorizes you to replace the item, but the source code indicates the items are assembled at a higher level, order the item from the higher level of maintenance.
AF (Assembled by DS/AVUM Level)		
AH (Assembled by GS Category)		
AL (Assembled by SRA)		
AD (Assembled by Depot)		

Explanation

- XA - - Do not requisition an "XA"-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)
- XB - - If an "XB" item is not available from salvage, order it using the FSCM and part number given.
- XC - - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
- XD - - Item is not stocked. Order an "XD"-coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1

- (2) **Maintenance Code.** Maintenance codes tells you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:
- (a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance.

Code

Application/Explanation

- C - Crew or operator maintenance done within the organization or aviation unit maintenance.
- O - Organizational or aviation unit category can remove, replace, and use the item.

F - Direct support or aviation intermediate level can remove, replace, and use the item.

H - General support level can remove, replace, and use the item.

L - Specialized repair activity can remove, replace, and use the item.

D - Depot level can remove, replace, and use the item.

- (b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions). NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes. This position will contain one of the following maintenance codes.

Code	Application/Explanation
-------------	--------------------------------

O - Organizational or (aviation unit) is the lowest level that can do complete repair of the item.	
--	--

F - Direct support or aviation intermediate level is the lowest level that can do complete repair of the item.	
--	--

H - General Support is the lowest level that can do complete repair of the item.	
--	--

L - Specialized repair activity is the lowest level that can do complete repair of the item.	
--	--

D - Depot is the lowest level that can do complete repair of the item.	
--	--

Z - Nonreparable. No repair is authorized.	
--	--

B - No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item). However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.	
---	--

- (3) **Recoverability Code.** Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability Codes	Application/Explanation
---------------------------------	--------------------------------

Z - Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3rd position of SMR Code.	
---	--

**Recoverability
Codes**

Application/Explanation

- O - Repairable item. When not economically repairable, condemn and dispose of the item at organizational or aviation unit level.
- F - Repairable item. When uneconomically repairable, condemn and dispose of the item at the direct support or aviation intermediate level.
- H - Repairable item. When uneconomically repairable, condemn and dispose of the item at the general support level.
- D - Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
- L - Repairable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
- A - Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. FSCM (Column (3)). The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc. that supplies the item.

d. PART NUMBER (Column (4)). Indicates the primary number used by the manufacturer, (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. DESCRIPTION AND USABLE ON CODE (UOC) (Column (5)). This column includes the following information:

- (1) The Federal item name and, when required, a minimum description to identify the item.
- (2) The physical security classification of the item is indicated by the parenthetical entry, e.g., Phy Sec CI (C)-Confidential, Phy Sec CI (S)-Secret, Phy Sec CI (T)-Top-Secret.
- (3) Items that are included in kits and sets are listed below the name of the kit or set.
- (4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.
- (5) Part numbers of bulk materials are referenced in this column in the line entry for the item to be manufactured/fabricated.
- (6) When the item is not used with all serial numbers of the same model, the effective serial numbers are shown on the last line(s) of the description (before UOC).

- (7) The usable on code, when applicable (reference paragraph 5, Special Information).
- (8) In the Special Tools List Section, the basis of issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipment supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.
- (9) The statement "END OF FIGURE" appears just below the last item description in Column (5) for a given figure in both Section II and Section III.
- (10) The indenture, shown as dots appearing before the repair part, indicates that the item is a repair part of the next higher assembly.

f. **QTY (Column (6)).** The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in the column in lieu of a quantity indicates that the quantity is variable and may vary from application to application.

C-4. EXPLANATION OF INDEX FORMAT AND COLUMNS (SECTION IV).

a. NATIONAL STOCK NUMBER (NSN) INDEX.

- (1) **STOCK NUMBER Column.** This column lists the NSN in national item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the

NSN
NSN, i.e. (5305-01-574-1467)
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

- (2) **FIG. Column.** This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.
- (3) **ITEM Column.** The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. **PART NUMBER INDEX.** Part numbers in this index are listed in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combinations which place the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9, and each following letter or digit in like order).

- (1) **FSCM column.** The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.
- (2) **PART NUMBER Column.** Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.
- (3) **STOCK NUMBER Column.** This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and FSCM columns to the left.

- (4) **FIG. Column.** This column lists the number of the figure where the item is identified/located in Section II and Section III.
- (5) **ITEM Column.** The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

c. FIGURE AND ITEM NUMBER INDEX.

- (1) **FIG. Column.** This column lists the number of the figure where the item is identified/located in Section II and Section III.
- (2) **ITEM Column.** The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.
- (3) **STOCK NUMBER Column.** This column lists the NSN for the item.
- (4) **FSCM Column.** The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.
- (5) **PART NUMBER Column.** Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

C-5. SPECIAL INFORMATION.

a. USABLE ON CODE. The usable on code appears in the lower left corner of the Description column heading. Usable on codes are shown as "UOC:.." in the Description Column (justified left) on the last line of the applicable item description/nomenclature. Uncoded items are applicable to all models.

b. ASSOCIATED PUBLICATIONS. (Not applicable).

C-6. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Numbers or Part Numbers are NOT Known.

- (1) **First.** Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.
- (2) **Second.** Find the figure covering the assembly group of subassembly group to which the item belongs.
- (3) **Third.** Identify the item on the figure and note the item number.
- (4) **Fourth.** Refer to the Repair Parts List for the figure to find the part number for the item number noted on the figure.
- (5) **Fifth.** Refer to the Part Number Index to find the NSN, if assigned.

b. When National Stock Number or Part Number is Known:

- (1) **First.** Using the of National Stock Number and Part Numbers, find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification

Number (NIIN) sequence (see 4a.(1)). The part numbers in the Part Number index are listed in ascending alphanumeric sequence (see 4.b). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

- (2) **Second.** After finding the figure and item number, verify that the item is the one you are looking for, then locate the item number in the repair parts list for the figure.

C-7. ABBREVIATIONS. Abbreviations used in this manual are listed in MIL-STD-12.

Abbreviations	Explanation
HD (Unit of Measure)	Hundred
NPT	National Pipe Thread
CAD	Cadmium
FT	Feet

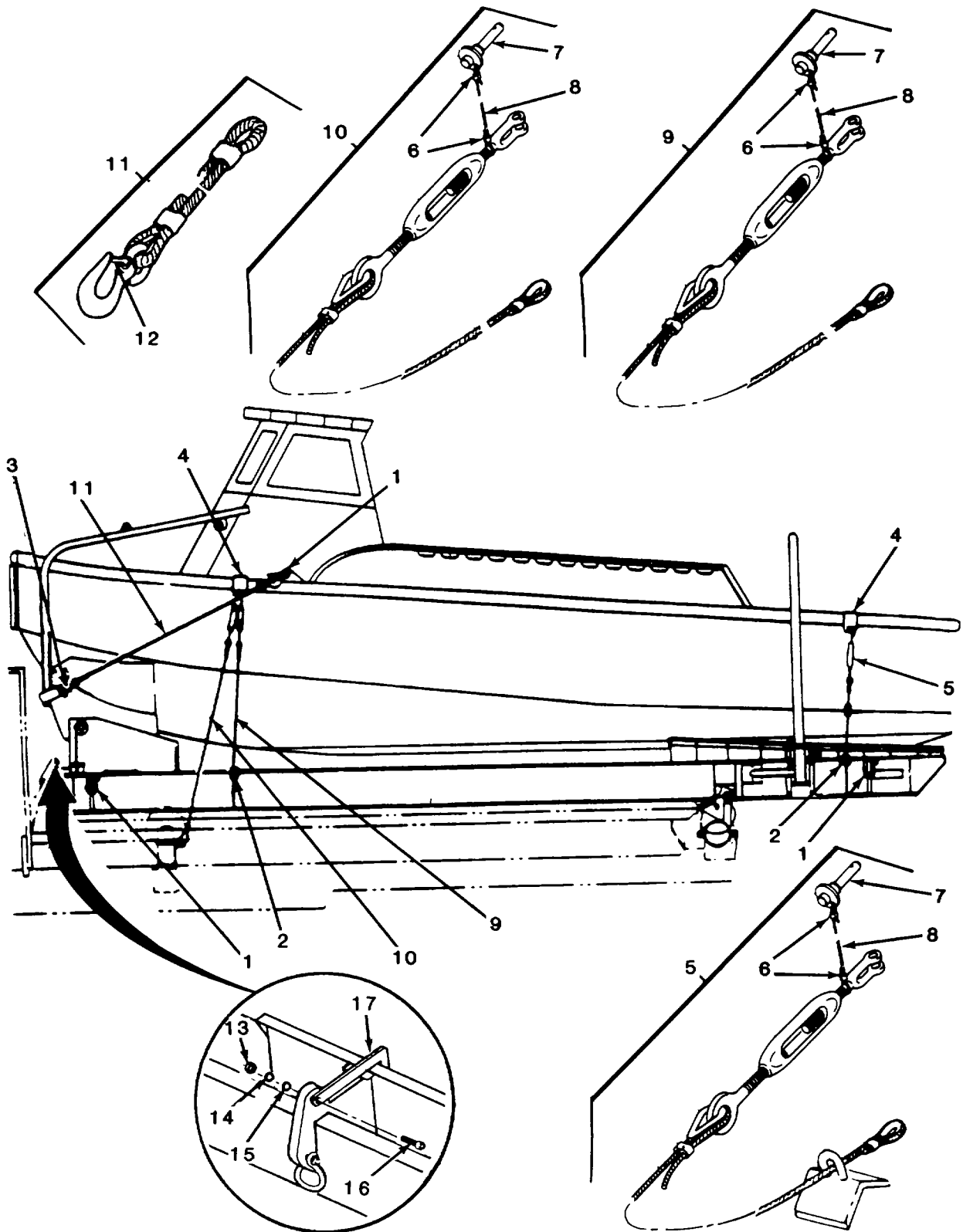


Figure C-1. Dolly Retainer Latch, Tie Down Cables, Hooks Shackles

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
-------------------	--------------------	-------------	-----------------------	---	------------

GROUP 01 CRADLE FRAME ASSEMBLY

FIG. C1 DOLLY RETAINER LATCH, TIE
DOWN CABLES, HOOKS AND
SHACKLES

1	PAOZZ	75535	10-18516	SHACKLE, ANCHOR, 7/8 IN.SCREW PIN.	6
2	PAOZZ	80205	NAS1042-8	SHACKLE ANCHOR, 1/2 IN. SCREW PIN	6
3	PAOZZ	75535	10-18491	SHACKLE, ANCHOR, 3/4 IN. SCREW PIN	1
4	PAOZZ	97403	13225E8245	HOOK, TIEDOWN.....	4
5	PBOZZ	97403	13225E8241-1	WIRE ROPE ASSEMBLY.....	2
6	PBOZZ	96906	MS51844-62	.SWAGING SLEEVE, WIRE 0.062 WIRE ROPE SIZE 1/16	2
7	PBOZZ	96906	MS17984C615	.PIN, QUICK RELEASE	1
8	MOOZZ	19099	3450T24-24	.ROPE, WIRE MAKE FROM ROPE, WIRE, P/N 3450T24.1/16 IN.NOM.DIA. 12.0 IN.REQUIRED	1
9	PBOZZ	97403	13225E8241-2	WIRE ROPE ASSEMBLY 0.375 IN., NOM., DIA., APPROX 40.00 IN.REQ'D.....	2
10	PBOZZ	97403	13225E8241-3	WIRE ROPE ASSEMBLY.....	2
11	PBOZZ	97403	13225E8243	CABLE ASSEMBLY 1/2 IN NOM DIM.....	2
12	PAOZZ	75535	S-4055	LATCH KIT.....	1
13	PAOZZ	96906	MS35691-57	NUT, PLAIN, HEXAGON .750-10 UNC-2B	1
14	PAOZZ	96906	MS35338-51	WASHER, LOCK 3/4IN.NOM SIZE	1
15	PAOZZ	96906	MS27183-23	WASHER, FLAT 0.812 INN	1
16	PAOZZ	96906	MS51975-61	SCREW, SHOULDER SOCKET, HEX HEAD 1.0 IN	1
17	PAOZZ	97403	13225E8249	RETAINER, DOLLY.....	1

END OF FIGURE

C-11

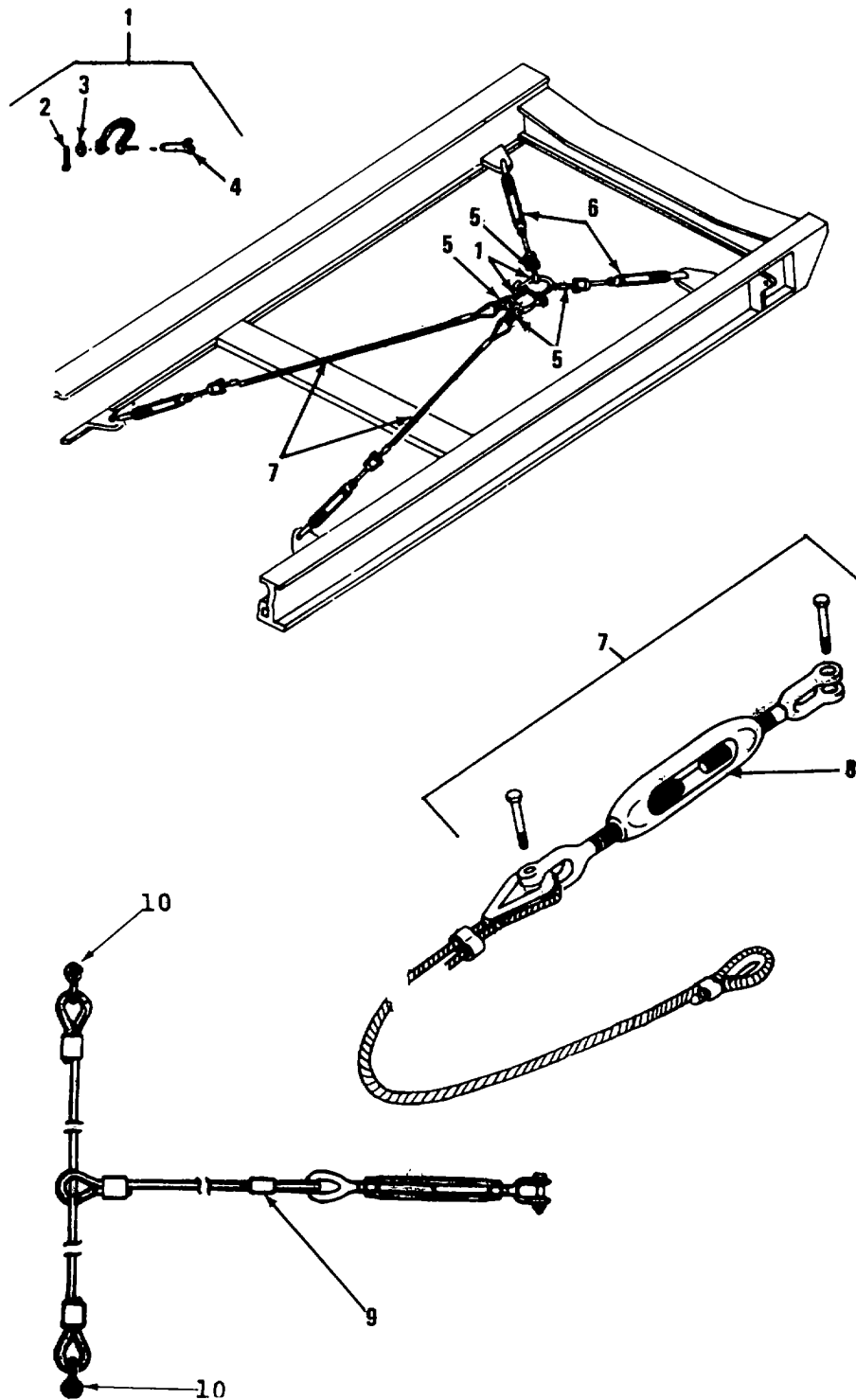


Figure C-2. Cable Assembly and Shackles

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
GROUP 01 CRADLE FRAME ASSEMBLY					
FIG. C2 CABLE ASSEMBLY AND SHACKLES					
1	PAOZZ	75535	10-18213	SHACKLE, ANCHER 1 1/4 IN. ROUND PIN.....	2
2	PAOZZ	96906	M524665-657	PIN, COTTER 1/4 IN. DIA	1
3	PAOZZ	96906	M527183-31	WASHER, FLAT 1.500 X 3.250 OD X..... 1.80 THICK BSC	1
4	PAOZZ	97403	13220E1029	PIN, STRAIGHT, HEADED.....	1
5	PAOZZ	75535	10-18516	SHACKLE, ANCHOR, 7/8 NOM. DIA. SCREW PIN.....	4
6	PAOZZ	39428	3000T681	TURNBUCKLE, JAW & EYE, 1 X 12	2
7	PBOZZ	97403	13220E1030-3	CABLE ASSEMBLY LASHING	2
8	PAOZZ	75535	10-32812	.TURNBUCKLE JAW & JAW.....	1
9	PBOZZ	97403	13225E8242	WIRE ROPE ASSEMBLY CANOPY HOLDDOWN, 3/8 1N.DIA.....	1
10	PAOZZ	39428	3558T46	.SHACKLE ANCHOR, 5/16 IN. SCREW	2
				PIN.....	

END OF FIGURE

C-13

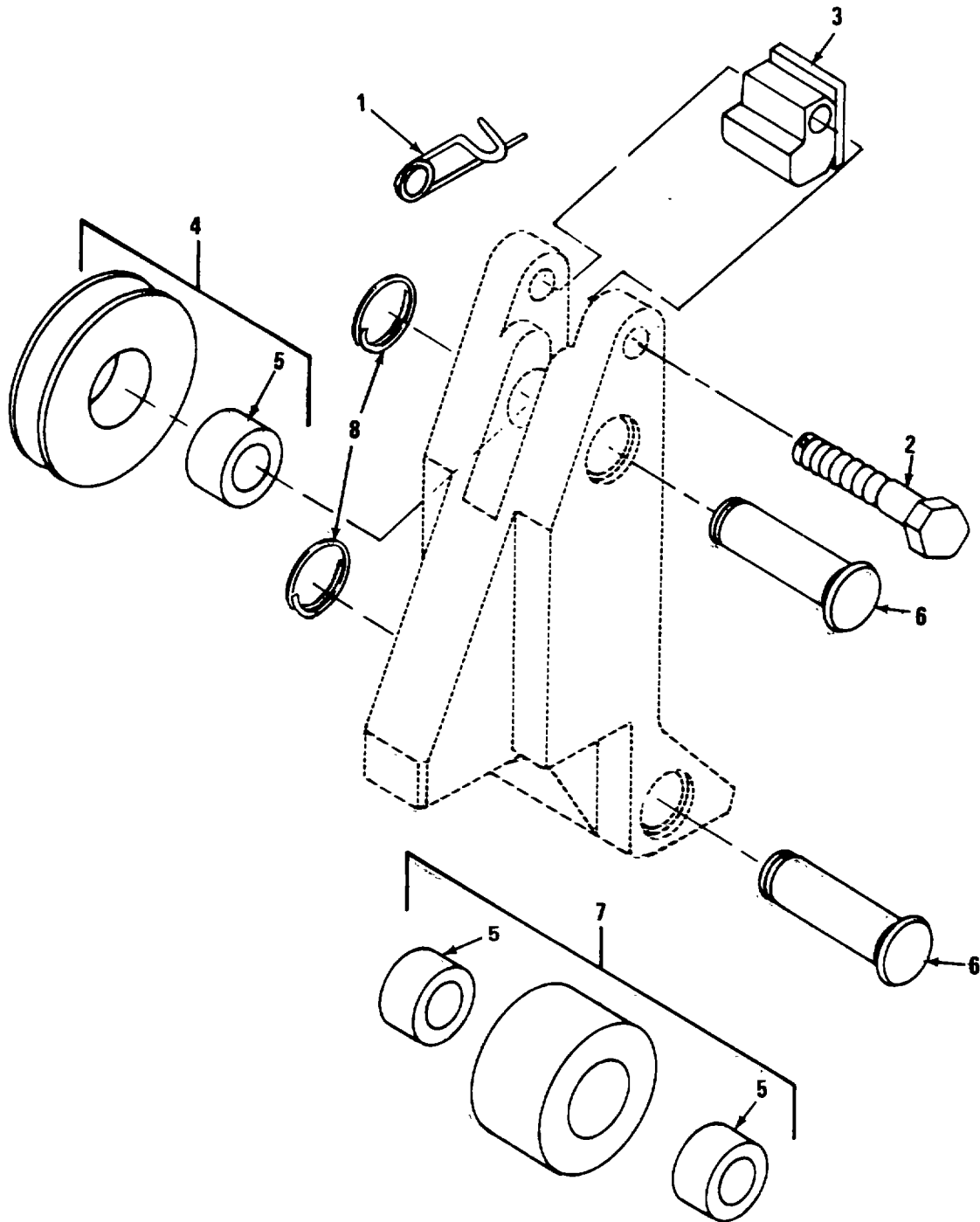


Figure C-3. Latch Block Roller Assy

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
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GROUP 01 CRADLE FRAME ASSEMBLY

FIG. C3 LATCH BLOCK ROLLER ASSEMBLY

1	PAOZZ	81349	MILR52243	RETAINER BRIDGE PIN, 3.75 NOM. LG..	1
2	PAOZZ	96906	MS51109-173	SCREW,CAP,HEX HEAD.....	1
3	PAOZZ	97403	13225E8251	BLOCK,CABLE RETAIN BLOCK.....	1
4	XDOZZ	97403	13220E1018	SHEAVE.....	1
5	XDOZZ	97403	13220E1020	.BEARING, ROLLER.....	3
6	XDOZZ	97403	13220E1017	AXLE.....	2
7	XDOZZ	97403	13220E1019	BEARING, ROLLER.....	1
8	PAOZZ	81349	M27426-2114B	RING, RETAINING.....	2

END OF FIGURE

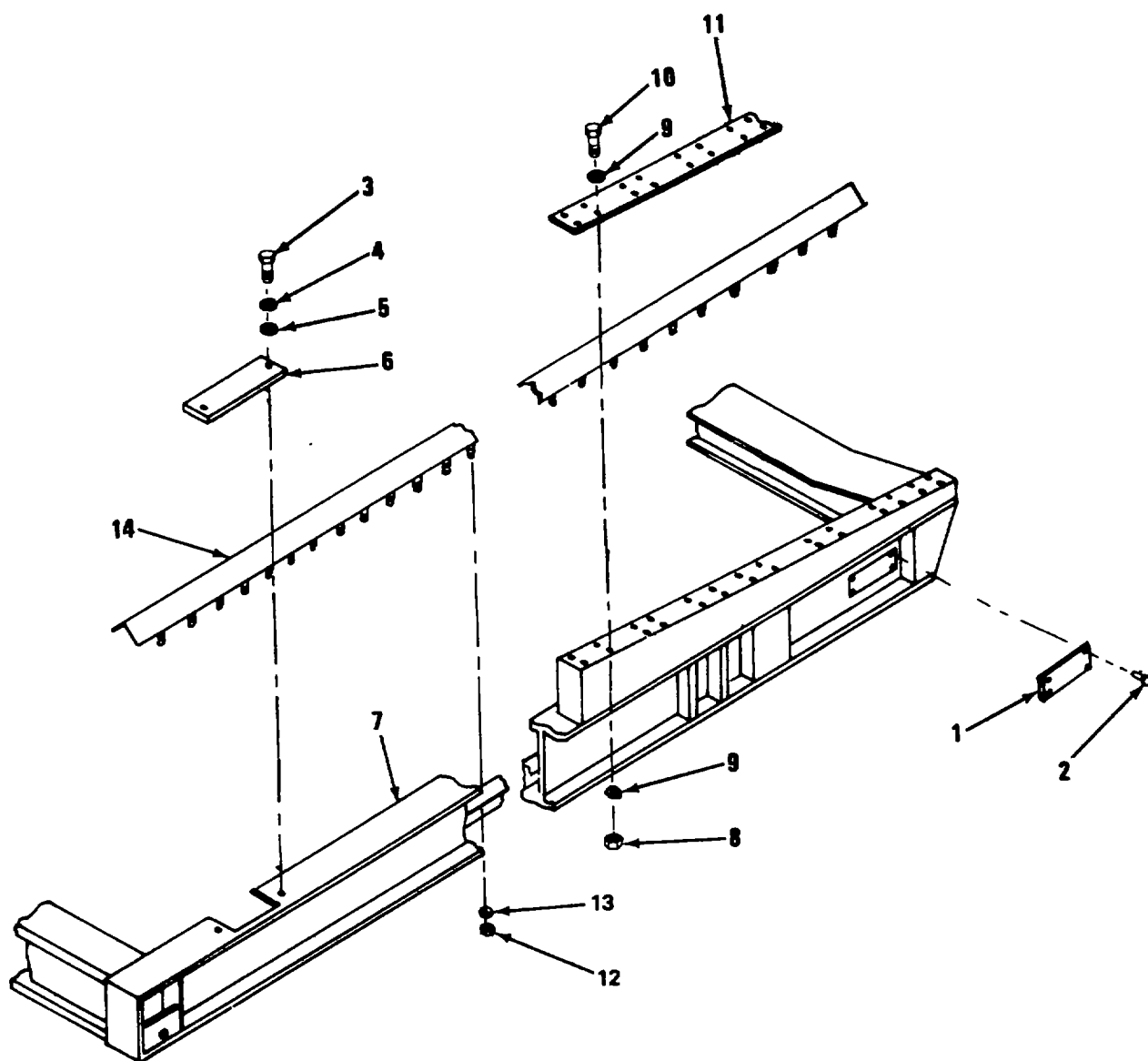


Figure C-4. Access Cover, Rails, Pads and Data Plate.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
GROUP 01 CRADLE FRAME ASSEMBLY					
FIG. C4 ACCESS COVER, RAILS, PADS AND DATA PLATE					
1	PFOZZ	97403	13225E8244	PLATE, IDENTIFICATION.....	1
2	PAOZZ	96906	MS24662-205	RIVET,BLIND .188 NOM DIA X .297 TO .359 GRIP LG X .469 L.....	4
3	PAOZZ	96906	MS90728-85	SCREW,CAP,HEXAGON H UNC-2A 7/16-14 X 1.000 L.....	4
4	PAOZZ	96906	MS35338-47	WASHER,LOCK-SPRING 7/16 IN.....	4
5	PAOZZ	96906	MS27183-16	WASHER, FLAT.....	4
6	XBOZZ	97403	13220E1015	COVER, ACCESS.....	2
7	XBOFF	97403	13225E8233	CRADLE.....	1
8	PAOZZ	96906	MS51967-8	.NUT,PLAIN,HEXAGON 3/8-16 UNC-2B..	56
9	PAOZZ	96906	MS27183-14	.WASHER, FLAT.....	112
10	PAOZZ	96906	MS90728-64	.SCREW,CAP,HEXAGON H 3/8-16 UNC-2A X 1.50 L.....	56
11	PAOZZ	97403	13225E8246	.PAD,RUBBER.....	2
12	PAOZZ	96906	MS51922-17	NUT,SELF-LOCKING,HE 3/8-16 UNC-2B..	46
13	PAOZZ	96906	MS27183-15	WASHER,FLAT .438 ID X 1.000 OD X .083 THK.....	46
14	XBOZZ	97403	13220E1014	RAIL,BOAT CRADLE	2

END OF FIGURE

C-17

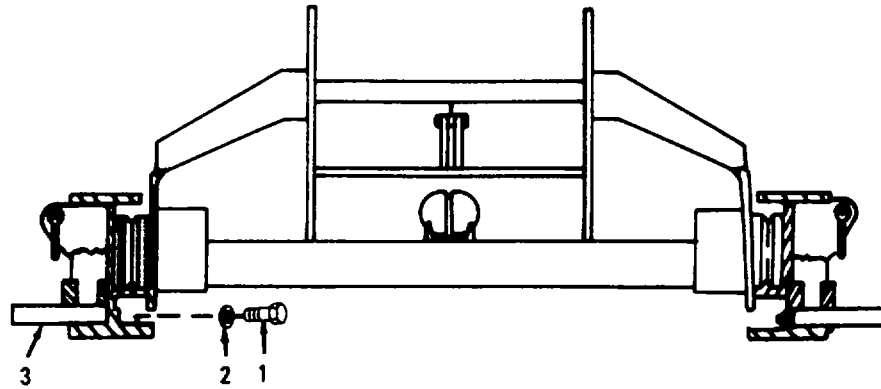


Figure C-5. Stop Pins.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
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GROUP 01 CRADLE FRAME ASSEMBLY

FIG. C5 STOP PINS

1	PAOZZ	96906	MS90726-61	SCREW,CAP, HEX HEAD 3/8-24 X 1.125	4
2	PAOZZ	96906	MS27183-14	L.....	4
3	XDOZZ	97403	13220E1016	WASHER,FLAT.....	4
				PIN, CRADLE STOP	4

END OF FIGURE

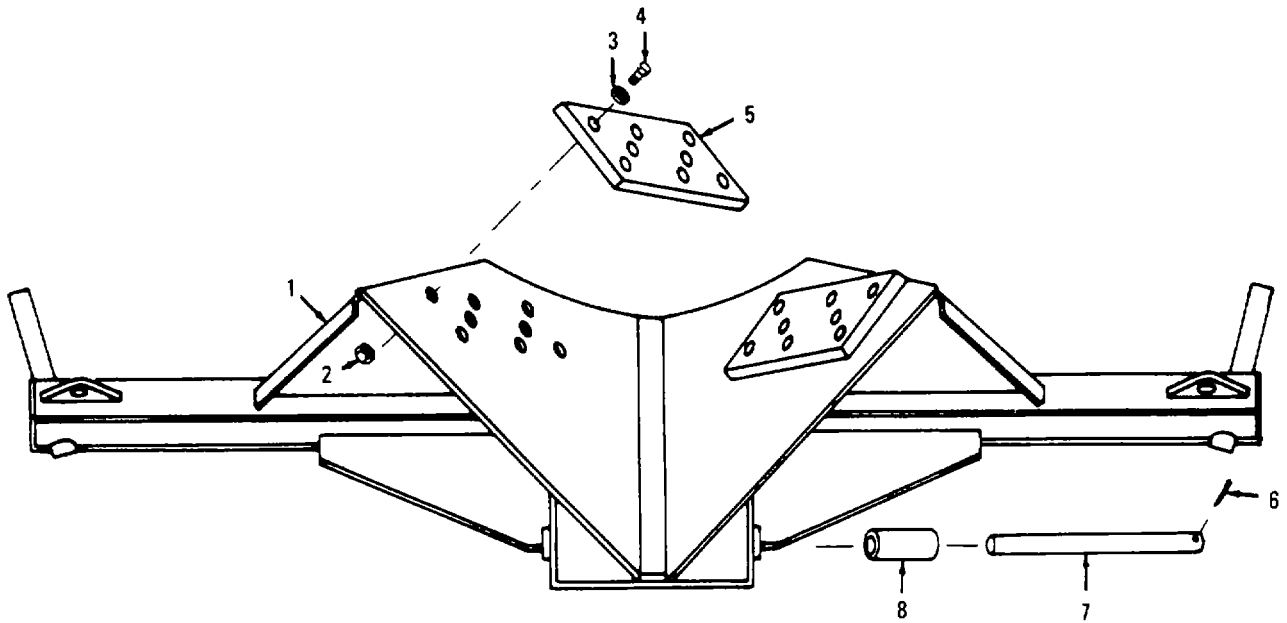


Figure C-6. Saddle.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
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GROUP 02 DOLLY ASSEMBLY

FIG. C6 SADDLE

1	XBOOO	97403	13225E8234	SADDLE,BOAT CRADLE	1
2	PAOZZ	96906	MS51967-8	.NUT, PLAIN, HEXAGON 3/8-16 UNC-2B	16
3	PAOZZ	96906	MS27183-14	.WASHER,FLAT 3/8 IN	32
4	PAOZZ	96906	MS90728-64	.SCREW,CAP,HEXAGON H.....	16
5	PAOZZ	97403	13225E8246	.PAD,RUBBER	2
6	PAOZZ	96906	MS24665-517	PIN,COTTER 3/16 IN	2
7	XBOZZ	97403	13225E8238	SHAFT,SADDLE PIVOT	1
8	XBOZZ	97403	13225E8237	SPACER, PIVOT SHAFT	2

END OF FIGURE

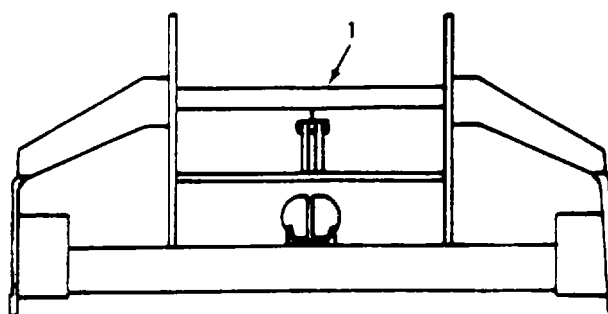


Figure C-7. Dolly.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
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GROUP 02 DOLLY ASSEMBLY

FIG. C7 DOLLY

1	XBOZZ	97403	13225E8235	DOLLY,BOAT CRADLE.....	1
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END OF FIGURE

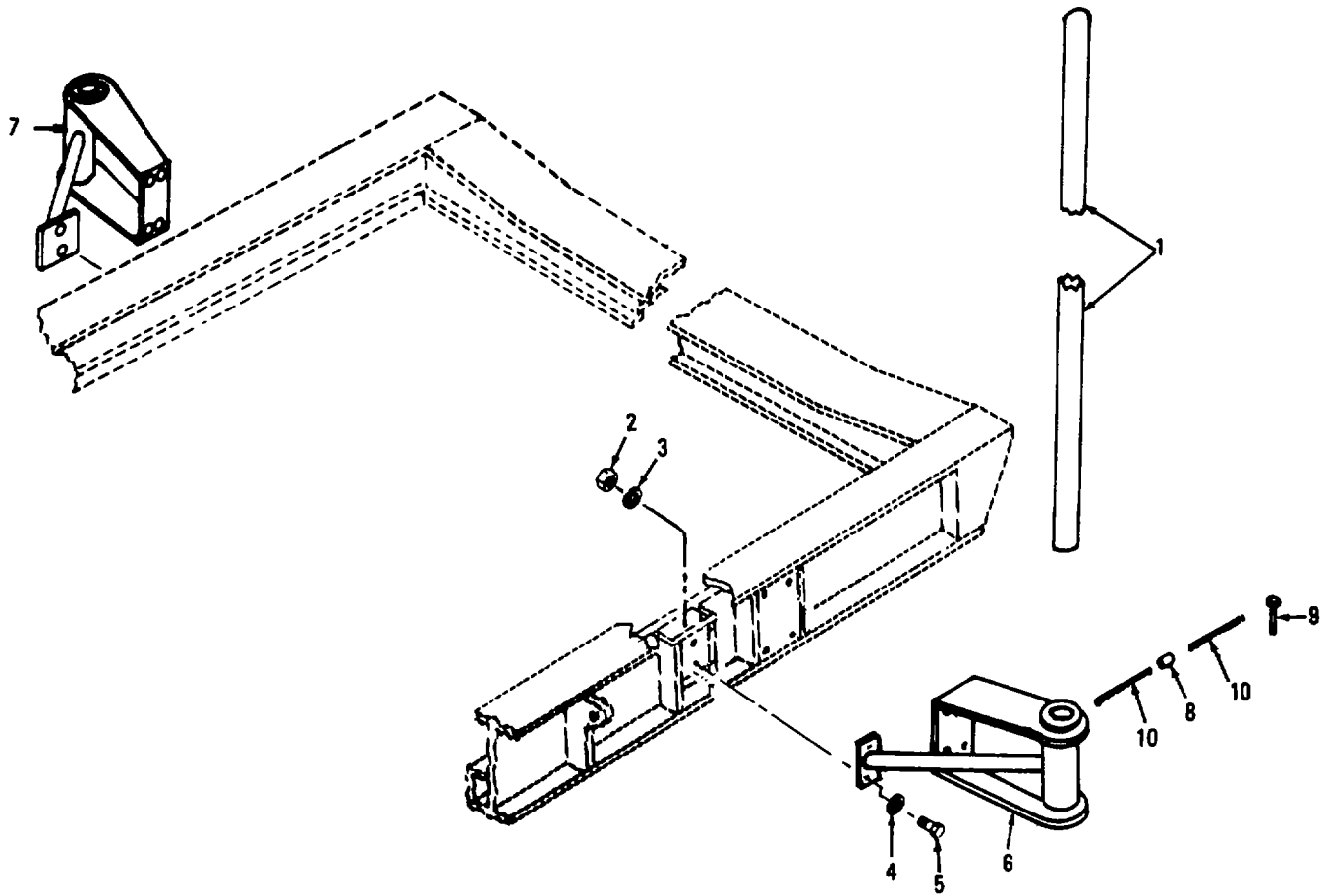


Figure C-8. Rear Stanchion and Base Assembly.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
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GROUP 02 DOLLY ASSEMBLY

FIG. C8 REAR STANCHION AND BASE
ASSEMBLY

1	PAOZZ	97403	13225E8236	STANCHION	2
2	PAOZZ	96906	MS51968-14	NUT, PLAIN, HEXAGON, 1/2 IN.....	12
3	PAOZZ	96906	MS35338-48	WASHER, LOCK 1/2 IN	12
4	PAOZZ	96906	MS27183-18	WASHER, FLAT.....	12
5	PAOZZ	96906	MS90726-115	SCREW, CAP, HEX HEAD UNF-2A 1/2-20 X 2.000 L	12
6	PBOZZ	97403	13225E8248	BASE, STANCHION COMPONENT PARTS SAME AS BASE, P/N 13225E8247	1
7	PBOZZ	97403	13225E8247	BASE, STANCHION, LH COMPONTS SAME AS BASE, P/N 13225E8247	1
8	PAOZZ	96906	MS51844-62	● SWAGING SLEEVE, WIRE 0.062 IN. WRS.....	2
9	PAOZZ	96906	MS17984C836	●PIN, QUICK RELEASE	1
10	MOOZZ	19099	3450T24-24	●ROPE, WIRE MAKE FROM ROPE, WIRE, P/N 3450T24, 1/16 IN. NOM. DIA. 18.0 IN. REQUIRED	1

END OF FIGURE

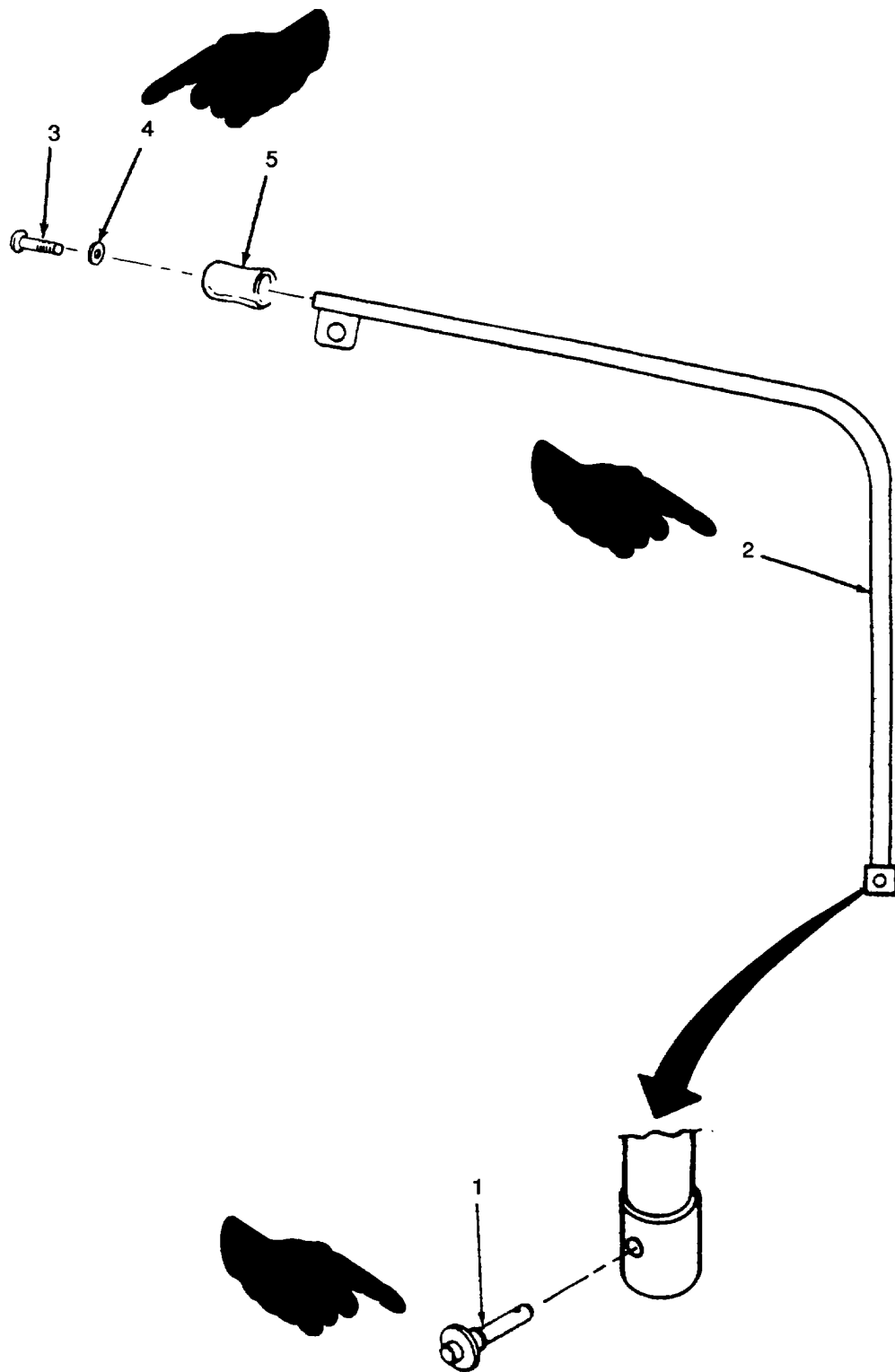


Figure C-9. Front Stanchion

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
1	PAOZZ	96906	MS17984C425	PIN, QUICK RELEASE. 1/4 IN DIA. X 2.5 GRIP LENGTH.....	1
2	PAOZZ	97403	13225E8239	STANCHION, CABLE ATTACHMENT	1
3	PAOZZ	96906	MS35338-48	● WASHER, LOCK 1/2 IN.....	1
4	PAOZZ	96906	MS15795-811	●WASHER, FLAT	1
5	PAOZZ	70485	613	●BUMPER, RUBBER.....	1

END OF FIGURE

Change 1 C-27

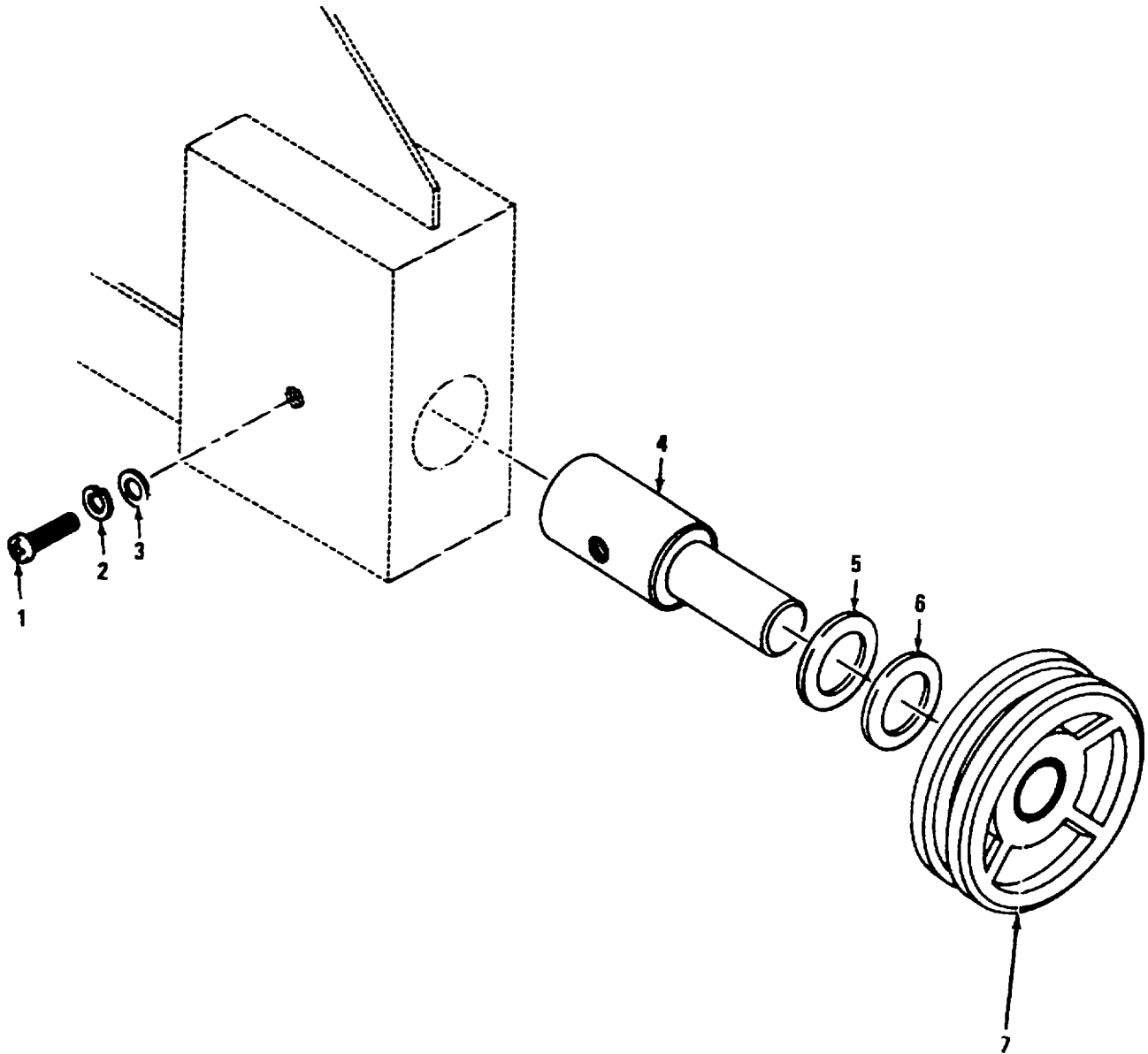


Figure C-9. Front Stanchion

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC) GROUP 02 DOLLY ASSEMBLY	(6) QTY
FIG. C10 WHEEL ASSEMBLY, SHAFT AND THRUST WASHERS					
1	PAOZZ	96906	MS90726-115	SCREW,CAP, HEX HEAD.....	4
2	PAOZZ	96906	MS35338-48	WASHER,LOCK.....	4
3	PAOZZ	96906	MS27183-18	WASHER,FLAT.....	4
4	XDOZZ	97403	13220E1027	AXLE, DOLLY.....	4
5	XDOZZ	97403	13220E1012	WASHER/THRUST	4
6	PAOZZ	97403	13225E8250	SPACER,DOLLY WHEEL	1
7	PBOZZ	97403	13220E1050	HEEL ASSEMBLY.....	4

END OF FIGURE

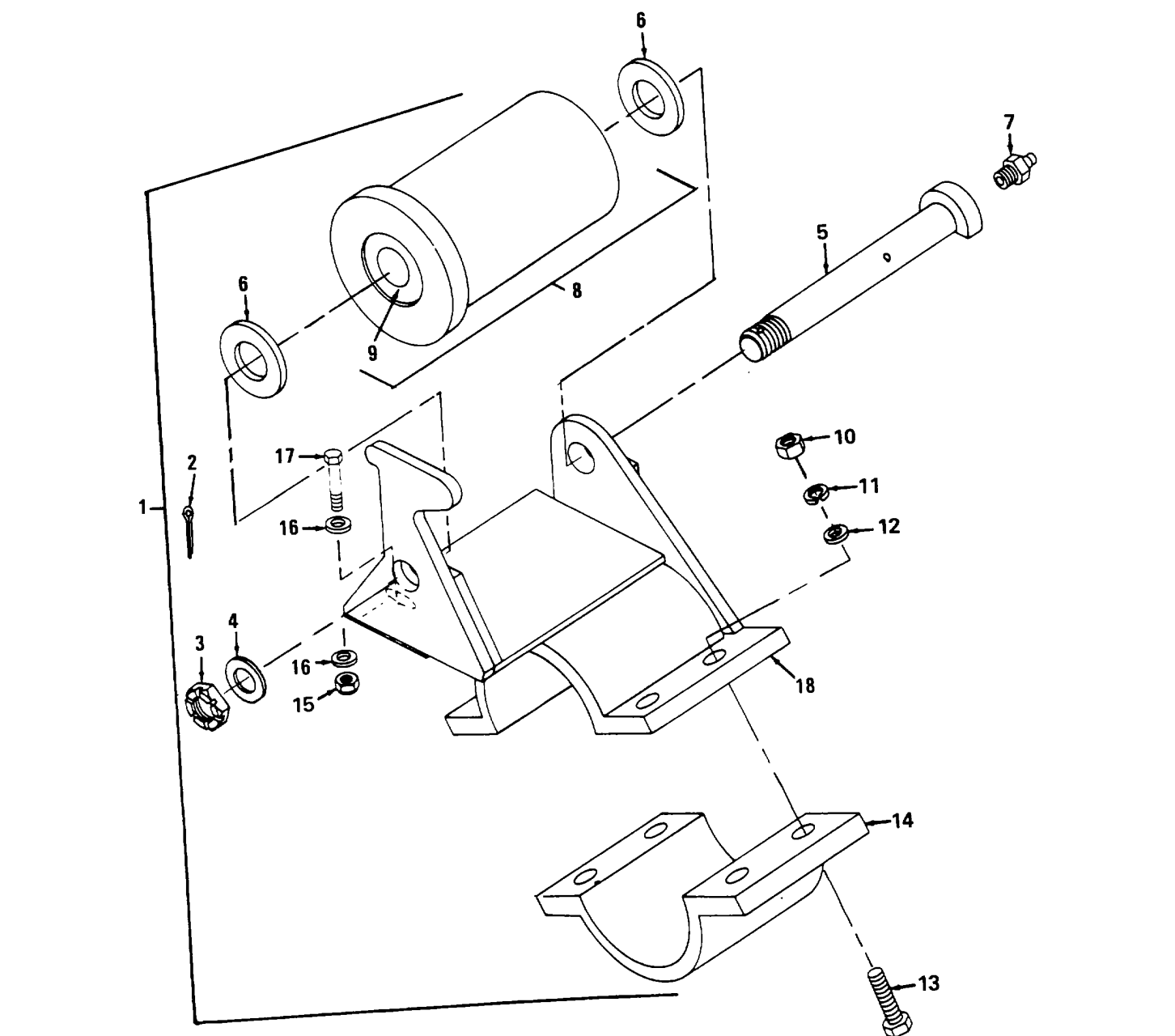


Figure C-11. Right and Left Hand Roller Assembly.

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
GROUP 03 ROLLER ASSEMBLIES					
FIG. C11 RIGHT AND LEFT HAND ROLLER ASSEMBLY					
1	PBOOZ	9U098	13220E1040	ROLLER ASSEMBLY,LH (COMPONENT PARTS SAME AS ROLLER ASSY,P/N 13220E1041,EXCEPT FOR MOUNTING BRACKET	1
1	PBOOZ	9U098	13220E1041	ROLLER ASSEMBLY,RH (COMPONENT PARTS SAME AS ROLLER ASSY,P/N 13220E1040 EXCEPT FOR MOUNTING BRACKET	1
2	PAOZZ	96906	MS24665-657	.PIN,COTTER 1/4 IN	1
3	PAOZZ	96906	MS35692-97	.NUT,SLOTTED,HEXAGON	1
4	PAOZZ	96906	MS27183-31	.WASHER,FLAT 1.500 IN.....	1
5	PAOZZ	97403	13220E1036	.AXLE,ROLLER	1
6	PAOZZ	97403	13218E4046	.WASHER,THRUST	2
7	PAOZZ	96906	MS15003-1	.FITTING,LUBRICATION 1/8 IN.,PTX11/16 IN.,LG.....	1
8	PAOOZ	97403	13220E1035	.ROLLER,BOAT CRADLE	1
9	PAOZZ	97403	13218E4042	..BUSHING 2	2
10	PAOZZ	96906	MS51968-14	.NUT,PLAIN,HEXAGON, 1/2 IN.....	4
11	PAOZZ	96906	MS35338-48	.WASHER,LOCK 1/2 IN. CAP MTG	4
12	PAOZZ	96906	MS27183-18	.WASHER,FLAT,.....	4
13	PAOZZ	96906	MS90726-118	.SCREW,CAP, HEX HEAD.....	4
14	PAOZZ	97403	13220E1039	.CAP,ROLLER.....	1
15	PAOZZ	96906	MS51922-17	.NUT,SELF-LOCKING,	2
16	PAOZZ	96906	MS27183-15	WASHER, FLAT	4
				UOC:DLJ	
17	PAOZZ	96906	MS90728-64	.SCREW,CAP,HEXAGON H 3/8 IN	2
18	XAOZZ	97403	13220E1037	.BRACKET,ROLLER,LH (USED ON ROLLER ASSY,P/N 13220E1040 ONLY)	1
18	PAOZZ	97403	13220E1038	.BRACKET,ROLLER,RH	1

END OF FIGURE

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC) GROUP 04 BULK MATERIALS	(6) QTY
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FIG. BULK

1	PAOZZ	39428	3450T24	.ROPE,WIRE,1/16 INCH NOM. DIA	V
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END OF FIGURE

Section III. SPECIAL TOOLS LIST

(Not Applicable)

SECTION IV

CROSS-REFERENCE INDEXES
NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4730-00-050-4208	C11	7	5305-01-015-6637	C3	2
5305-00-052-8907	C9	4	5365-01-017-4612	C3	8
5305-00-071-1786	C4	3	4030-01-088-2952	C1	6
5310-00-080-6004	C4	9		C8	8
	C5	2	2090-01-123-7953	C8	1
	C6	3	2090-01-124-3231	C1	11
5310-00-087-4652	C4	12	2090-01-124-3232	C1	10
	C11	15	2090-01-124-3233	C1	9
5340-00-159-3746	C8	9	2090-01-124-3234	C1	5
4030-00-162-9668	C1	1	2090-01-128-4612	C9	3
	C2	5	3120-01-152-2352	C11	9
5315-00-187-9415	C2	2	5340-01-153-8915	C1	12
	C11	2	5340-01-157-9472	C1	4
5310-00-209-0965	C4	4	4010-01-164-3856	C2	9
4010-00-222-4494	BULK	1	2090-01-169-9147	C10	7
5305-00-226-7768	C8	5	2090-01-172-8734	C8	7
	C10	1	2040-01-172-8735	C8	6
5305-00-269-2804	C5	1	2090-01-184-6143	C1	17
5315-00-276-7675	C6	6	2090-01-184-6144	C3	3
4030-00-282-4885	C2	10	5320-01-212-3504	C4	2
5310-00-470-9340	C11	3	4010-01-227-1798	C2	7
4030-00-542-3180	C1	2	2090-01-227-7968	C4	11
2090-00-582-2230	C11	1		C6	5
5310-00-584-5272	C8	3			
	C10	2			
	C11	11			
5310-00-584-7888	C1	14			
5315-00-606-0063	C2	4			
5305-00-702-9070	C9	2			
5305-00-716-8181	C11	13			
5305-00-725-2317	C4	10			
	C6	4			
	C11	17			
5310-00-732-0558	C4	8			
	C6	2			
5310-00-732-0560	C8	2			
	C11	10			
5310-00-809-4061	C4	13			
	C11	16			
5310-00-809-4085	C4	5			
5310-00-809-5998	C8	4			
	C10	3			
	C11	12			
5310-00-809-8533	C1	15			
5310-00-838-1702	C1	13			
5310-00-880-5977	C9	6			
5310-00-929-1807	C9	1			
5340-00-937-0965	C1	7			
5310-00-950-1309	C2	3			
	C11	4			

SECTION IV

CROSS-REFERENCE INDEXES

PART NUMBER INDEX				
FSCM	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81349	MILR52243		C3	1
96906	MS15003-1	4730-00-050-4208	C11	7
96906	MS15795-811	5310-00-880-5977	C9	6
96906	MS17984C615	5340-00-937-0965	C1	7
96906	MS17984C836	5340-00-159-3746	C8	9
96906	MS24630-61	5305-00-052-8907	C9	4
96906	MS24662-205	5320-01-212-3504	C4	2
96906	MS24665-517	5315-00-276-7675	C6	6
96906	MS24665-657	5315-00-187-9415	C2	2
			C11	2
96906	MS27183-14	5310-00-080-6004	C4	2
			C6	3
96906	MS27183-15	5310-00-809-4061	C4	13
			C11	16
96906	MS27183-16	5310-00-809-4085	C4	5
96906	MS27183-18	5310-00-809-5998	C8	4
			C10	3
			C11	12
96906	MS27183-23	5310-00-809-8533	C1	15
96906	MS27183-31	5310-00-950-1309	C2	3
			C11	4
96906	MS35307-318	5305-00-702-9070	C9	2
96906	MS35338-47	5310-00-209-0965	C4	4
96906	M535338-48	5310-00-584-5272	C8	3
			C10	2
			C11	11
96906	MS35338-51	5310-00-584-7888	C1	14
96906	MS35691-57	5310-00-838-1702	C1	13
96906	MS35692-97	5310-00-470-9340	C11	3
96906	MS51109-173	5305-01-015-6637	C3	2
96906	MS51844-62	4030-01-088-2952	C1	6
			C8	8
96906	MS51922-17	5310-00-087-4652	C4	12
			C11	15
96906	MS51922-2	5310-00-929-1807	C9	1
96906	MS51967-8	5310-00-732-0558	C4	8
			C6	2
96906	MS51968-14	5310-00-732-0560	C8	2
			C11	10
96906	MS51975-61		C1	16
96906	MS90726-115	5305-00-226-7768	C8	5
			C10	1
96906	MS90726-118	5305-00-716-8181	C11	13
96906	MS90726-61	5305-00-269-2804	C5	1
96906	MS90728-64	5305-00-725-2317	C4	10
			C6	4
			C11	17
96906	MS90728-85	5305-00-071-1786	C4	3
81349	M27426-2114B	5365-01-017-4612	C3	8
80205	NAS1042-8	4030-00-542-3180	C1	2

SECTION IV

TM 2090-12&P/1A

CROSS-REFERENCE INDEXES

PART NUMBER INDEX				
FSCM	PART NUMBER	STOCK NUMBER	FIG.	ITEM
75535	S-4055	5340-01-153-8915	C1	12
75535	10-18213		C2	1
75535	10-18491		C1	3
75535	10-18516	4030-00-162-9668	C1	1
			C2	5
75535	10-32812		C2	8
97403	13218E4042	3120-01-152-2352	C11	9
97403	13218E4046		C11	6
97403	13220E1012		C10	5
97403	13220E1014		C4	14
97403	13220E1015		C4	6
97403	13220E1016		C5	3
97403	13220E1017		C3	6
97403	13220E1018		C3	4
97403	13220E1019		C3	7
97403	13220E1020		C3	5
97403	13220E1027		C10	4
97403	13220E1029	5315-00-606-0063	C2	4
97403	13220E1030-3	4010-01-227-1798	C2	7
97403	13220E1035		C11	8
97403	13220E1036		C11	5
97403	13220E1037		C11	18
97403	13220E1038		C11	18
97403	13220E1039		C11	14
9U098	13220E1040	2090-00-582-2230	C11	1
9U098	13220E1041		C11	1
97403	13220E1050	2090-01-169-9147	C10	7
97403	13225E8233		C4	7
97403	13225E8234		C6	1
97403	13225E8235		C7	1
97403	13225E8236	2090-01-123-7953	C8	1
97403	13225E8237		C6	8
97403	13225E8238		C6	7
97403	13225E8239	2090-01-128-4612	C9	3
97403	13225E8241-1	2090-01-124-3234	C1	5
97403	13225E8241-2	2090-01-124-3233	C1	9
97403	13225E8241-3	2090-01-124-3232	C1	10
97403	13225E8242	4010-01-164-3856	C2	9
97403	13225E8243	2090-01-124-3231	C1	11
97403	13225E8244		C4	1
97403	13225E8245	5340-01-157-9472	C1	4
97403	13225E8246	2090-01-227-7968	C4	11
			C6	5
97403	13225E8247	2090-01-172-8734	C8	7
97403	13225E8248	2040-01-172-8735	C8	6
97403	13225E8249	2090-01-184-6143	C1	17
97403	13225E8250		C10	6
97403	13225E8251	2090-01-184-6144	C3	3
97403	13225E8252		C9	5
39428	3000T681		C2	6
39428	3450T24	4010-00-222-4494	BULK	1

SECTION IV

TM 2090-12&P/1A

CROSS-REFERENCE INDEXES

FSCM	PART NUMBER	PART NUMBER INDEX		FIG.	ITEM
		STOCK NUMBER			
19099	3450T24-24			C1	8
				C8	10
39428	3558T46	4030-00-282-4885		C2	10

SECTION IV

TM 2090-12&P/1A

CROSS-REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	FSCM	PART NUMBER
BULK	1	4010-00-222-4494	39428	3450T24
C1	1	4030-00-162-9668	75535	10-18516
C1	2	4030-00-542-3180	80205	NAS1042-8
C1	3		75535	10-18491
C1	4	5340-01-157-9472	97403	13225E8245
C1	5	2090-01-124-3234	97403	13225E8241-1
C1	6	4030-01-088-2952	96906	MS51844-62
C1	7	5340-00-937-0965	96906	MS17984C615
C1	8		19099	3450T24-24
C1	9	2090-01-124-3233	97403	13225E8241-2
C1	10	2090-01-124-3232	97403	13225E8241-3
C1	11	2090-01-124-3231	97403	13225E8243
C1	12	5340-01-153-8915	75535	5-4055
C1	13	5310-00-838-1702	96906	MS35691-57
C1	14	5310-00-584-7888	96906	MS35338-51
C1	15	5310-00-809-8533	96906	MS27183-23
C1	16		96906	MS51975-61
C1	17	2090-01-184-6143	97403	13225E8249
C2	1		75535	10-18213
C2	2	5315-00-187-9415	96906	MS24665-657
C2	3	5310-00-950-1309	96906	MS27183-31
C2	4	5315-00-606-0063	97403	13220E1029
C2	5	4030-00-162-9668	75535	10-18516
C2	6		39428	3000T681
C2	7	4010-01-227-1798	97403	13220E1030-3
C2	8		75535	10-32812
C2	9	4010-01-164-3856	97403	13225E8242
C2	10	4030-00-282-4885	39428	3558T46
C3	1		81349	MILR52243
C3	2	5305-01-015-6637	96906	MS51109-173
C3	3	2090-01-184-6144	97403	13225E8251
C3	4		97403	13220E1018
C3	5		97403	13220E1020
C3	6		97403	13220E1017
C3	7		97403	13220E1019
C3	8	5365-01-017-4612	81349	M27426-2114B
C4	1		97403	13225E8244
C4	2	5320-01-212-3504	96906	MS24662-205
C4	3	5305-00-071-1786	96906	MS90728-85
C4	4	5310-00-209-0965	96906	MS35338-47
C4	5	5310-00-809-4085	96906	MS27183-16
C4	6		97403	13220E1015
C4	7		97403	13225E8233
C4	8	5310-00-732-0558	96906	MS51967-8
C4	9	5310-00-080-6004	96906	MS27183-14
C4	10	5305-00-725-2317	96906	MS90728-64
C4	11	2090-01-227-7968	97403	13225E8246
C4	12	5310-00-087-4652	96906	M551922-17
C4	13	5310-00-809-4061	96906	MS27183-15
C4	14		97403	13220E1014
C5	1	5305-00-269-2804	96906	MS90726-61

SECTION IV

TM 2090-12&P/1A

CROSS-REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	FSCM	PART NUMBER
C5	2	5310-00-080-6004	96906	MS27183-14
C5	3		97403	13220E1016
C6	1		97403	13225E8234
C6	2	5310-00-732-0558	96906	MS51967-8
C6	3	5310-00-080-6004	96906	MS27183-14
C6	4	5305-00-725-2317	96906	MS90728-64
C6	5	2090-01-227-7968	97403	13225E8246
C6	6	5315-00-276-7675	96906	MS24665-517
C6	7		97403	13225E8238
C6	8		97403	13225E8237
C7	1		97403	13225E8235
C8	1	2090-01-123-7953	97403	13225E8236
C8	2	5310-00-732-0560	96906	MS51968-14
C8	3	5310-00-584-5272	96906	MS35338-48
C8	4	5310-00-809-5998	96906	MS27183-18
C8	5	5305-00-226-7768	96906	MS90726-115
C8	6	2040-01-172-8735	97403	13225E8248
C8	7	2090-01-172-8734	97403	13225E8247
C8	8	4030-01-088-2952	96906	MS51844-62
C8	9	5340-00-159-3746	96906	MS17984C836
C8	10		19099	3450T24-24
C9	1	5310-00-929-1807	96906	MS51922-2
C9	2	5305-00-702-9070	96906	MS35307-318
C9	3	2090-01-128-4612	97403	13225E8239
C9	4	5305-00-052-8907	96906	MS24630-61
C9	5		97403	13225E8252
C9	6	5310-00-880-5977	96906	MS15795-811
C10	1	5305-00-226-7768	96906	MS90726-115
C10	2	5310-00-584-5272	96906	MS35338-48
C10	3	5310-00-809-5998	96906	MS27183-18
C10	4		97403	13220E1027
C10	5		97403	13220E1012
C10	6		97403	13225E8250
C10	7	2090-01-169-9147	97403	13220E1050
C11	1		9U098	13220E1041
C11	1	2090-00-582-2230	9U098	13220E1040
C11	2	5315-00-187-9415	96906	MS24665-657
C11	3	5310-00-470-9340	96906	MS35692-97
C11	4	5310-00-950-1309	96906	MS27183-31
C11	5		97403	13220E1036
C11	6		97403	13218E4046
C11	7	4730-00-050-4208	96906	MS15003-1
C11	8		97403	13220E1035
C11	9	3120-01-152-2352	97403	13218E4042
C11	10	5310-00-732-0560	96906	MS51968-14
C11	11	5310-00-584-5272	96906	MS35338-48
C11	12	5310-00-809-5998	96906	MS27183-18
C11	13	5305-00-716-8181	96906	MS90726-118
C11	14		97403	13220E1039
C11	15	5310-00-087-4652	96906	MS51922-17
C11	16	5310-00-809-4061	96906	MS27183-15

SECTION IV**TM5-2090-202-12&P
TM 2090-12&P/1A****CROSS-REFERENCE INDEXES****FIGURE AND ITEM NUMBER INDEX**

FIG.	ITEM	STOCK NUMBER	FSCM	PART NUMBER
C11	17	5305-00-725-2317	96906	MS90728-64
C11	18		97403	13220E1037
C11	18		97403	13220E1038

APPENDIX D

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

SECTION I. INTRODUCTION

D-1. SCOPE

This appendix lists components of end item and basic issue items for the Cradle, Bridge Erection Boat to help you inventory items required for safe and efficient operation.

D-2. GENERAL

The Components of End Item and Basic Items Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the cradle in operation, and to perform emergency repairs. Although shipped separately packaged, BII must be with the cradle during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

D-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column (1) Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2) National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3) Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item.

SECTION I. INTRODUCTION -Continued.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea. in, pr).

e. Column (5) - Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

APPENDIX D SECTION II. COMPONENTS OF END ITEMS

(1) ILLUS. NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) U/M	(5) QTY rqr
C-11	2090-00-586-0351	Roller Assembly, Right Hand	EA	1
C-11	2090-00-582-2230	Roller Assembly, Left Hand	EA	1
C-1	2090-01-124-3234	Wire Rope Assembly (Tie-down Cable Assembly)	EA	2
C-1	2090-01-124-3233	Wire Rope Assembly (Tie-down Cable Assembly)	EA	2
C-1	2090-01-124-3232	Wire Rope Assembly (Tie-down Cable Assembly)	EA	2
C-1	2090-01-124-3231	Cable Assembly	EA	2
C-2	4010-01-227-1798	Cable Assembly	EA	2
C-2	4010-01-164-3856	Wire Rope Assembly (Canopy hold-down)	EA	1
C-9	2090-01-128-4612	Stanchion, Front	EA	2
C-8	2090-01-123-7953	Stanchion, Rear	EA	2
SECTION III. BASIC ISSUE ITEMS		Technical Manual, TM 5-2090-202-12&P/ TM 2090-12&P/1A, Cradle, Bridge Erection Boat	EA	1

APPENDIX E

ADDITIONAL AUTHORIZATION LIST

SECTION I. INTRODUCTION

E-1. SCOPE

This appendix lists additional items you are authorized for the support of the Cradle, Bridge Erection Boat.

E-2. GENERAL

This list identifies items that do not have to accompany the Cradle, Bridge Erection Boat and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

E-3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, NTOE, TDA, or JTA) which authorizes the item(s) to you.

E-2

APPENDIX F

EXPENDABLE/DURABLE SUPPLIES AND MATERIELS LIST

SECTION I. INTRODUCTION

F-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the Cradle, Bridge Erection Boat. These items are authorized to you by CTA 50-970, Expendable items (Except Medical, Class V, Repair Parts, and Heraldic items).

F-2. EXPLANATION OF COLUMNS

a. Column (1)-Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. F").

b. Column (2)-Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew

O -Organizational Maintenance

c. Column (3)-National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column (4)-Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column (5)-Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea. in. pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	0		Adhesive (97403) 13222E0002	PT
2	0	9150-00-190-0907	Grease, Automotive	LB
3*	0	8010-01-193-0516	Primer, Epoxy Coating (Corrosion Inhibiting Coating, Aliphatic Polyurethane	QT
4*	0	8010-01-160-6741	Green 383	QT
5*	0	8010-01-160-6744	Brown 383	QT
6*	0	8010-01-160-2419	Black	QT
7	0	7920-00-148-9666	Rag, Wiping	LB
8	0	7920-00-282-9246	Brush, Wire	EA
9	0	7930-00-889-3479	Soap, Floor	GL
10	0	6850-00-110-4498	Dry Cleaning Solvent P-D-680	QT

* Refer to TM 43-0139 for authorized variations and associated painting materials

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By Order of the Secretaries of the Army and Navy (Including the Marine Corps).

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Chief of Staff

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PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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